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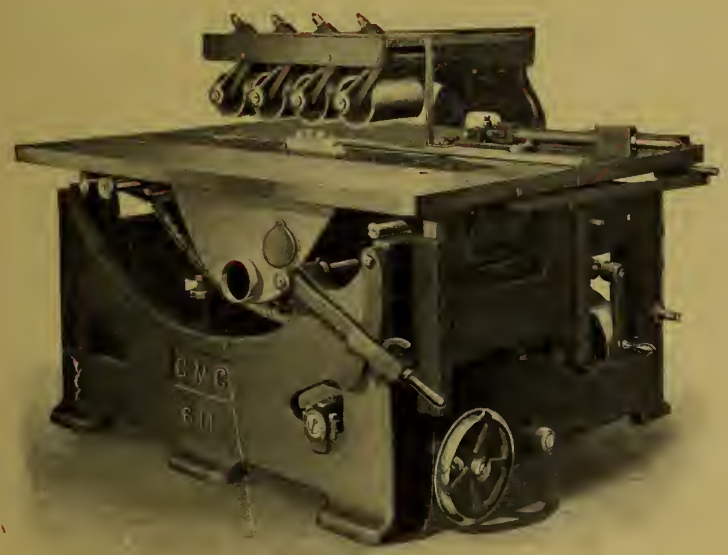
LIMITED
145-149 ADELAIDE STREET WEST
TORONTO CANADA

Volume Twenty-One TORONTO, JANUARY, 1921 Number One

CANADIAN WOODWORKER and Furniture Manufacturer



C.M.C.

No. 611 Straight Edge Ripping and Jointing Saw

This Saw is, we believe, the strongest feeding and most accurate machine of its type on the market to-day. Some of the largest furniture and piano manufacturers of Canada are to-day glueing up their stock right off this Saw without further trueing up on the Jointer, and find the saving in material and labor greatly reduces their operating costs. Why not investigate its merits and be convinced?

Write for our special bulletin "Cut your Costs on a 611 Straight Edging and Jointing Machine." It will interest you.

CANADA MACHINERY CORPORATION, LIMITED, GALT, ONTARIO

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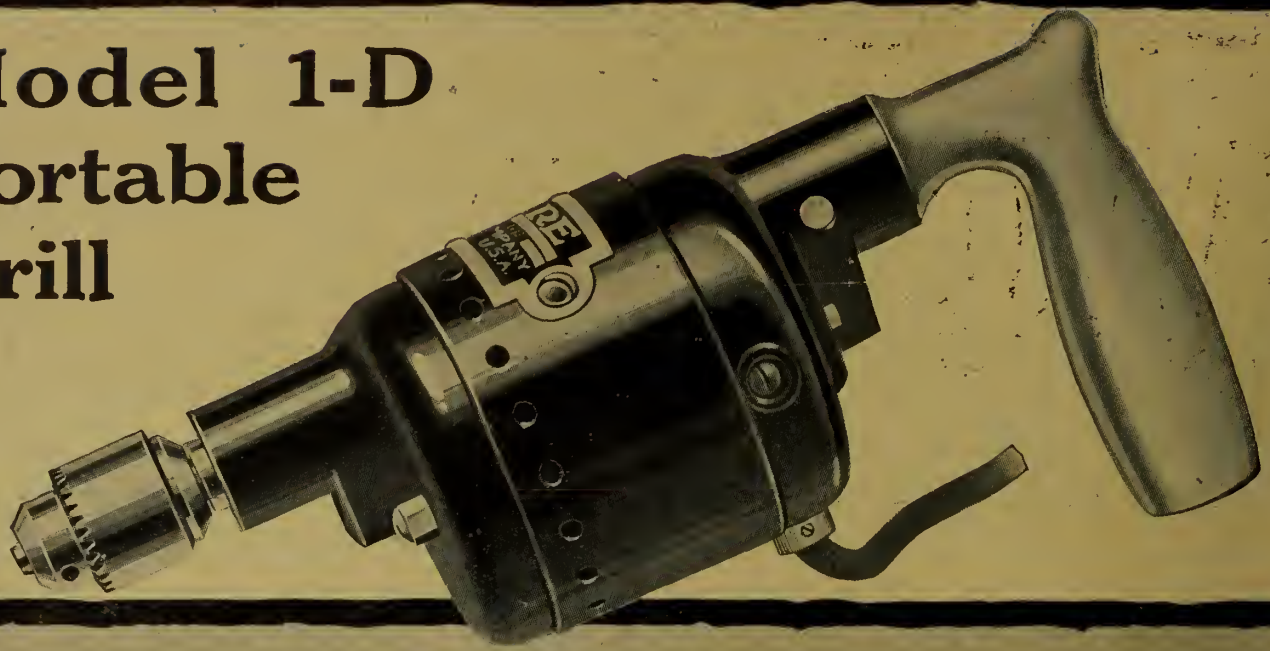
Model 1-D Portable Drill



HANDY—ECONOMICAL—EFFICIENT

Specifications:

Length—10 inches.

Weight—4¾ pounds.

Capacity—Steel, 0 to 3/16". Wood and alloys, 0 to 11/32".

Motor—Universal, on either direct or alternating current.

Diameter of Motor—3⅜ inches.

Spindle—Offset from center 33/64".

Helical Gears.

Aluminum Handle.

Complete with 10-ft. cord, plug, switch and chuck.

Jacob's Chucks used as a regular equipment.

FOR speed in drilling and countersinking small holes, this tool is just what you need. It can be used on any kind of material—steel, iron, brass, aluminum or wood—and gives lasting service.

If your dealer cannot supply you with the Model 1-D, tell us about your requirements.

Wisconsin Electric Company

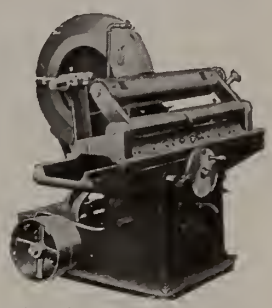
7131 Sixteenth Street, Racine, Wisconsin, U. S. A.

DUMORE GEARED ELECTRIC DRILLS

No. 1 Variety Saw

Woodworking Machinery

New——Used



American No. 200 Automatic Self-Feed Knife Grinder

All these machines are guaranteed in A-1 condition and can be seen in our warehouse at 163 Dufferin St., Toronto.

BAND SAWS
1—36″ Jackson Cochrane.
1—36″ Preston No. 132.

BUZZ PLANERS & JOINTERS
1—24″ American, (Fig. 824) with power feed.
1—No. 199 CMC, 16″ jointer.
1—24″ Preston round head jointer.

SAW TABLES
1—No. 30 American Universal saw bench.
1—No. 7½ American combination saw bench.
1—No. 127 Preston variety saw table.

EDGING SAWS
1—No. 25 American edging and ripping saw.

BORING MACHINES
1—CMC 2 spindle horizontal.
1—Andrews 18 spindle.

SAWS—RIP, CUT-OFF, MITRE, ETC.
1—No. 3 American double cut-off with power feed attachment.
1—No. 2 American iron frame rip saw, Fig. 575.
1—Jackson Cochrane self feed rip saw.
1—Double end mitre machine, CMC.
2—Yates No. 257 self feed rip saws

LATHES
1—CMC wood turning.
1—54″ heavy type back knife gauge.
1—36″ heavy type back knife gauge.
1—Wood lathe, c/s and equipment.

MOULDERS
1—Cowan 10″ four sided outside.
1—American No. 26, 10″ four sided outside.
1—American No. 22, 10″ four sided outside.
1—Hermance 8″ four sided outside.
1—Hespeler 10″ four sided outside.
1—American Houston 8″ four sided with 6″ heads.

SHAPERS
1—Ballantyne 2 spindle.
1—Preston 2 spindle.
1—American No. 1 single spindle.

SCREW DRIVERS
2—Reynolds No. 2, one equipped with boring attachment.
1—No. 4 Reynolds, with magazine for No. 10, 11 and 12 screws.

TENONERS
1—American No. 2½, (Fig. 9431).
1—Ballantyne single end.
1—Cowan single end.

MORTISERS
1—CMC, No. 507 with boring attachment.
1—Wysong & Miles hollow chisel.

PLANERS
1—Preston No. 121, 24″ pony planer.
1—American No. 4½, 36″ single surfacer.
1—MacGregor-Gourlay 24″, single surfacer with sectional rolls and chipbreaker.

ROD & DOWEL MACHINES
1—Jackson-Cochrane with Hawker head, capacity ¼ to 2″.

SANDERS
1—American No. 2 disc & spindle, with iron table.
1—American No. 5, 36″ double disc.
1—CMC No. 548 arm.
2—Canadian Sander Co. disc, motor driven.

FILING ROOM EQUIPMENT
3—Covel No. 40 automatic circular saw sharpeners.
1—No. 2, B.T. & B. band saw sharpener.
1—American No. 9, 37″ automatic knife grinder.
1—American No. 9, 31″ automatic knife grinder.

MISCELLANEOUS
2—Porter spindle carvers.
1—Valley City rounder, 2 spindle.
3—Linderman dovetail glue jointers.
1—Francis double roll 24″ glue spreader for animal glue.
1—45″ Sturtevant, double exhaust fan.
1—60″ Sturtevant single exhaust fan.
1—48 ″ Sturtevant single exhaust fan.
1—36″ Sturtevant, single exhaust fan.
1—No. 16 Detroit Blower Co. exhaust fan.
1—Oliver trimmer, pedestal type.

Pulleys—Wood split, solid iron and pressed steel.
Belting—All sizes, leather, single & double.
Shafting—Various sizes and lengths.

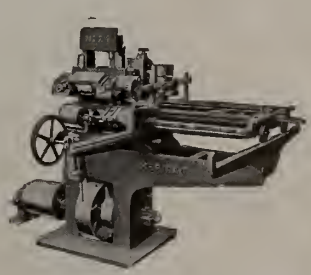
American No. 25 Power Feed Edging and Ripping Saw

Garlock-Walker Machinery Co., Limited

32 Front Street West

WINNIPEG TORONTO MONTREAL

Everything in Woodworking and Metal Working Machinery



American No. 2½ Single End Tenoning Machine

POWER APPARATUS

Of Established Reputation and Dependability

Weston Indicating Instruments

SANGAMO Integrating Instruments

ESTERLINE Graphic Instruments

ONDIT Oil Switches and Circuit Breakers

All above are standard equipment on our Power Switchboards.

CANADIAN CROCKER-WHEELER Induction Motors and Transformers A. C. Generators, D. C. Motors and Generators

CUTLER-HAMMER Control Apparatus, Magnetic Clutches, Lifting Magnets

Wagner, Quality Single Phase Motors

All distributed by

Northern Electric Company

LIMITED

MONTREAL

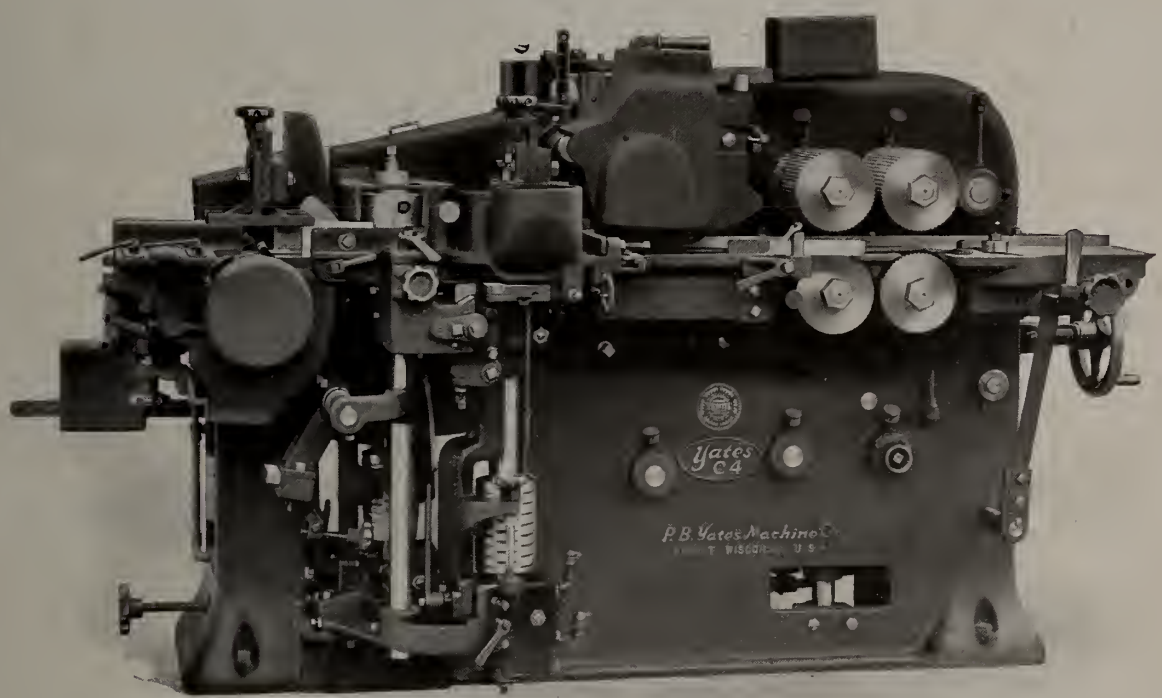
HALIFAX TORONTO
QUEBEC LONDON
OTTAWA HAMILTON

WINDSOR CALGARY
WINNIPEG EDMONTON
REGINA VANCOUVER

It's "Making Good"—

The Invariable Choice
Yates
Of the Man Who Knows

Type C3 and C4 Moulder



Although practically a new machine, its popularity is shown by the fact that **360** are to be found in mills and factories in North America.

What Greater evidence could you want—it's "Making Good" everywhere, all over the country.

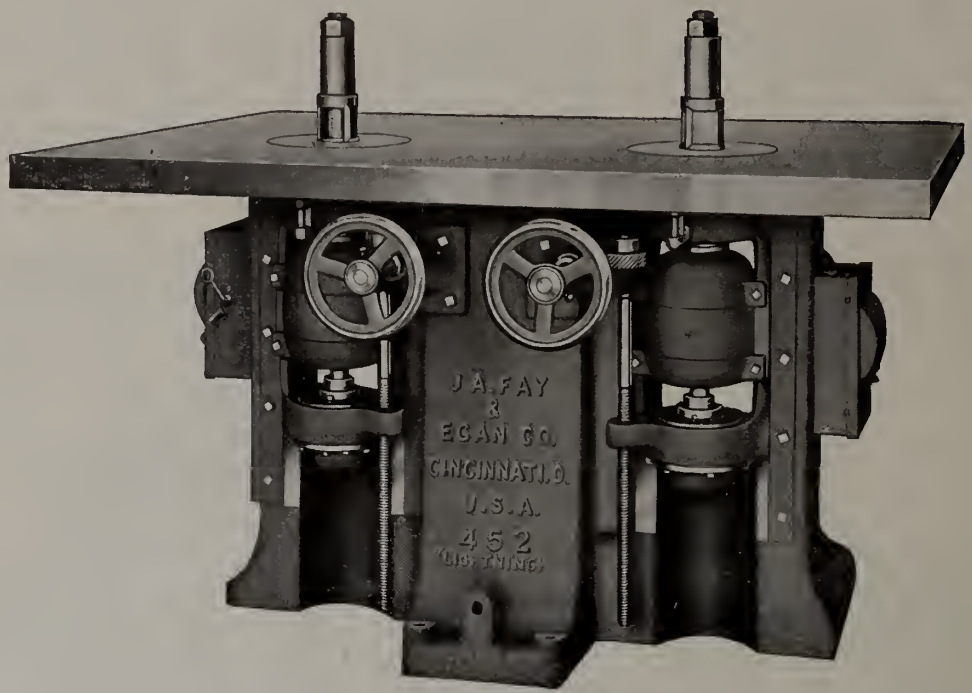
The many superior features have gained for it wide attention and scores of installations, as can be seen from the above figures.

We have a circular

P. B. Yates Machine Co. Limited

Hamilton - Canada

Perfect Work and a Maximum Output



No. 452 "Lightning" Motor Drive Shaper

No. 452 was designed to meet the increased demands made upon production. Built to produce the highest grade of work in furniture and automobile factories, carriage and wagon works, car shops and all kinds of woodworking plants.

The extreme high speed of the spindles insures perfect work and a maximum output. A high speed motor is mounted directly on each spindle, permitting the spindles to operate independently or simultaneously; this being the most modern development in direct motor application, eliminating all belts and countershafts and taking up considerably less floor space than a belt driven shaper. No power is wasted, and the motors have a large overload to take care of the heaviest cut made on a shaper.

For additional information about this wonderful machine write for Bulletin L-15

J. A. FAY & EGAN COMPANY

ESTABLISHED 1830

World's Oldest and Largest Manufacturers of Woodworking Machinery

153-163 West Front Street - Cincinnati, Ohio

The "Shimer Limited" Expansion Head

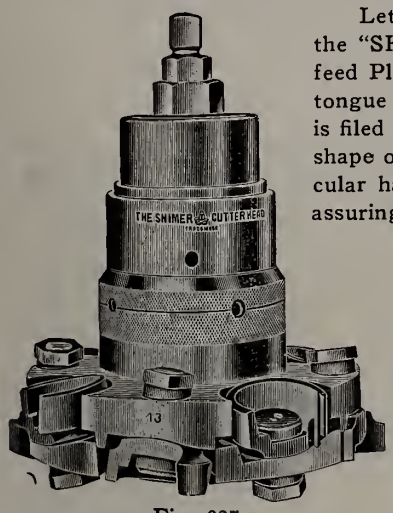


Fig. 627

Let us draw your attention to the advantages of using the "SHIMER CUTTER HEAD" for general Mill and fast feed Planer work. The Cutter is turned to cut the shape of tongue and groove desired, so that to sharpen the cutter it is filed or ground on its face, guaranteeing the user the same shape of cut during the life of the cutter. The bit being circular has from 3½ in. to 5 in. cutting length to the cutter, assuring long wearing life to the cutters

Note that the cutter, being fastened to a concave seat on a compound angle, assures the user of the proper clearance of cutters, consequently they never burn.

These heads are fitted with or without the Self-Centering Sleeve, and made Expansion or Solid, to suit the customer's wishes.

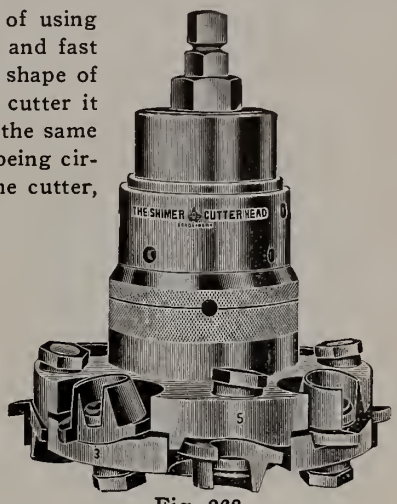


Fig. 268

Shimer Heads have been in use for sixty years, and their reliability and reputation have spoken for them in the past. Let us know your wants and we will guarantee their reliability at the present.

SHIMER CUTTER HEAD CO. OF CANADA, LIMITED

Manufacturers of Cutter Heads, Safety Cylinders and Grinders

GALT, ONTARIO

Cuts Down Labour Costs 85%

The Reynolds Machine with the Magazine Feed, is the logical solution for the question of more speed in production.

It works without a hitch and is capable of driving from 1000 to 1200 screws per hour.

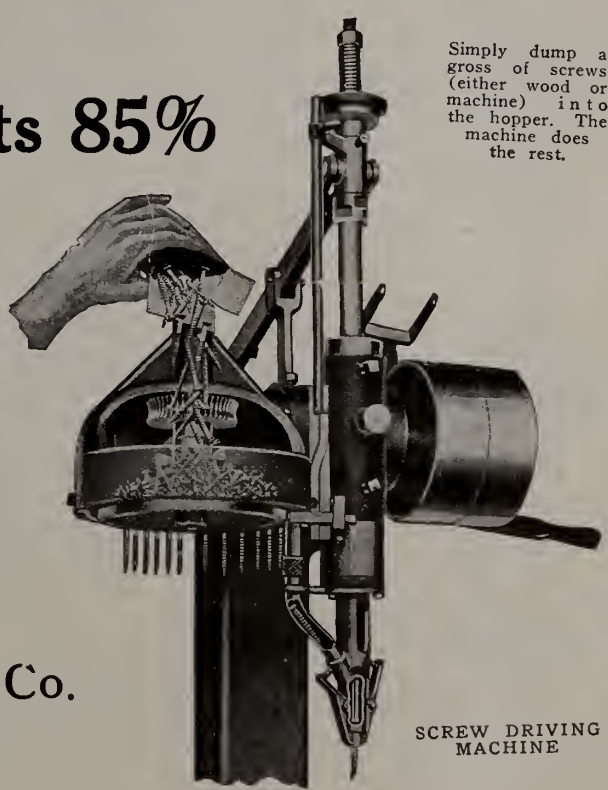
Does not require a skilled mechanic to operate.

Tell us the outside dimensions of your work, also gauge and length of screws, and we will quote on your requirements.

The Reynolds Machine Co.

Departmen C

Massillon, Ohio, U. S. A.



Simply dump a gross of screws (either wood or machine) into the hopper. The machine does the rest.

SCREW DRIVING MACHINE

WEST SIDE IRON WORKS

1220-1227 WASHINGTON BLVD. CHICAGO, ILL.

Manufacturers of Motor Driven and Ball Bearing Band Saws

Steel Wheels

Guide above and below table

Saw Guard

Direct Motor Drive

Motor with Gear

Motor with Belt Drive

MOST COMPLETELY EQUIPPED BAND SAW ON THE MARKET

THE VERY BEST

14 in., 36 in., 42 in. BAND SAWS AND 42 in. BAND RIP

Is it economical ?

Is it the right type ?

Is it the right size ?

THREE GUESSES

Electric power, heating, lighting and equipment problems are to be found in the woodworking industry.

Perhaps your output can be increased? You are, perhaps, losing electrical energy by wasteful types of motors? Are your switches and wiring devices up-to-date or are you in continual danger of fire?

We shall be pleased to answer any questions or help you with any problems whenever you care to write us.

Twice Monthly **Electrical News** $2.00 per year

345 Adelaide St. West., TORONTO

BEATS THEM ALL!

An Automatic Machine for Sanding Handles Smooth as Glass
in the Twinkling of an Eye

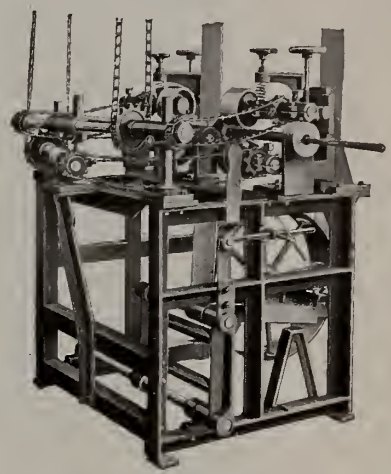
The Rapid Automatic
Sanding and Buffing Machine

Quality: It will make your handles as smooth as the highest grade furniture, their beautiful finish aiding greatly in their ready sale at top-notch prices.

Speed: It sands turned stock at the rate of 70 lineal feet a minute, which lowers the cost per handle to next to nothing.

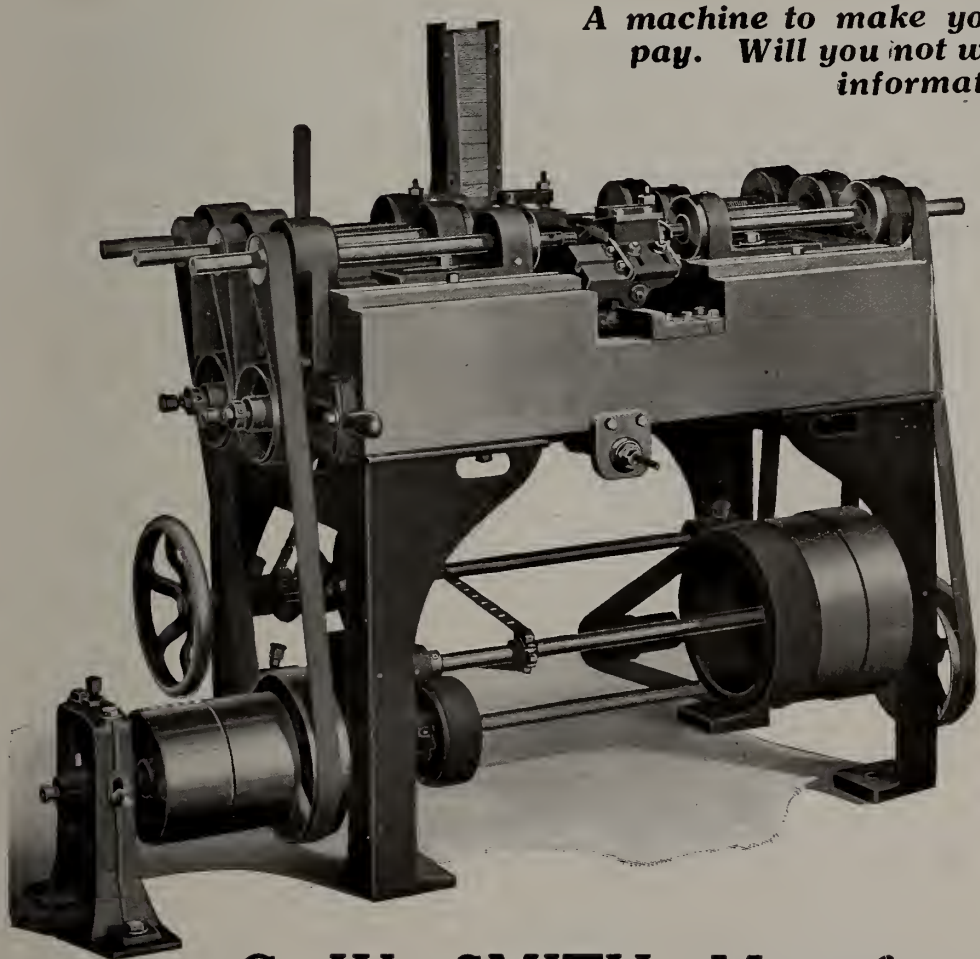
Method: The operation is automatic throughout. Large flat feed rolls, 6-in. diam. by 3-in. face, revolve the stock with such great rapidity against a single belt of fine sand cloth that it is all done with astonishing swiftness.

Capacity: Takes stock from 20 inches up to any length and ¼-in. to 1¾-in. diameter.



No. 75 Rapid Sander

A machine to make your handle business pay. Will you not write for complete information?



New Automatic Pail Handle Machine

which Bores and Turns in one operation.

Capacity from 25 to 40 handles per minute.

Holes are Bored clean and accurately with four Drills. Fitted up complete with Ball bearings and is the best and most perfect working Machine on the market.

C. W. SMITH, *Manufacturer*

503 Grandville Ave. - - Grand Rapids, Mich., U. S. A.

OLIVER MACHINERY CO.
MANCHESTER, ENGLAND

A. R. WILLIAMS MACHINERY CO.
TORONTO and MONTREAL, CANADA

"Treat Your Machine as a Living Friend."

A Canadian-Made Product

"PRESTON" No. 132 36 ins. BAND SAW

View Shows machine guarded with bottom iron doors open

SPECIAL FEATURES

1.—All Steel Wheels covered with solid rubber bands ¼" thick.

2.—Perfect Tension Device and style of guide that, combined, reduce saw-breakage to a minimum.

3.—Universal alignment of wheels.

4.—Convenient adjustments. Smooth, steady operation.

5.—Supplied with 3 H.P. Electric Motor for individual drive if desired.

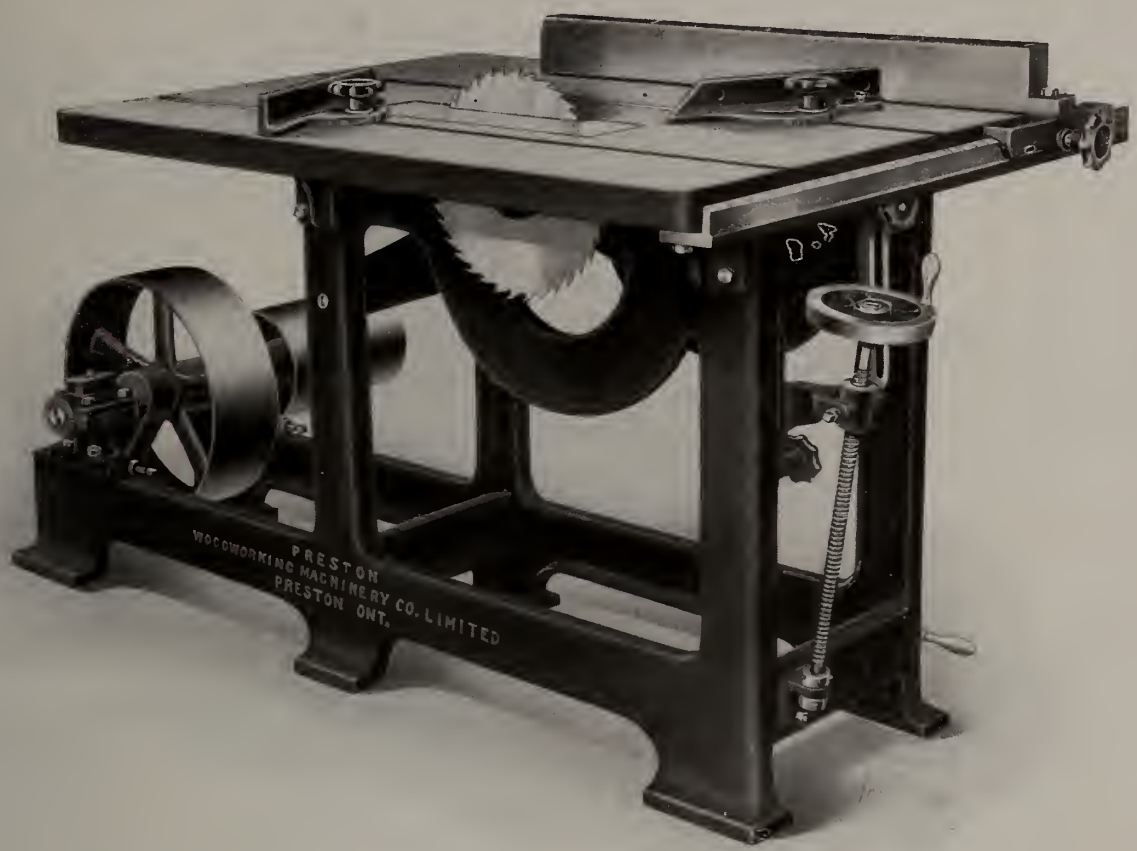
6.—Supplied with SKF Ball Bearings in upper and lower wheels if desired.

HAS FEW EQUALS—NONE ARE BETTER
Write for descriptive pamphlet and prices

The Preston Woodworking

PRESTON

A Simple, Practical Machine
For Fine Accurate Work



No. 125.—TILTING TOP SAW TABLE

Frame Cast in One Piece. **Easy and Rapid Adjustment of Saw.**
Special Locking Device. **Belt Tightening Bushes on Countershaft.**
Arranged for Individual Motor Drive if Desired.

This Engraving represents a new Rip and Cut Off Saw Table, a medium sized machine, convenient for Dadoing, Grooving, Rabbeting, Mitreing, Bevelling, Etc. It is intended especially for fine and accurate work on Furniture, Sash and Door, Cabinet, Pattern and General Woodworking Shops. The design is simple and practical and the construction is high-class throughout.

The Frame is cast in one solid piece making it rigid and strong. The Table is planed perfectly true and has a removable wood throat plate allowing extra thick saws or Dado Heads to be used. The machine will carry saw blades up to 14″ diameter.

A Boring attachment or a Boring and Mortising attachment with a wood table, can be furnished with this machine, if desired.

WRITE FOR BOOKLET AND PRICES.

Machinery Company, Ltd.
ONTARIO

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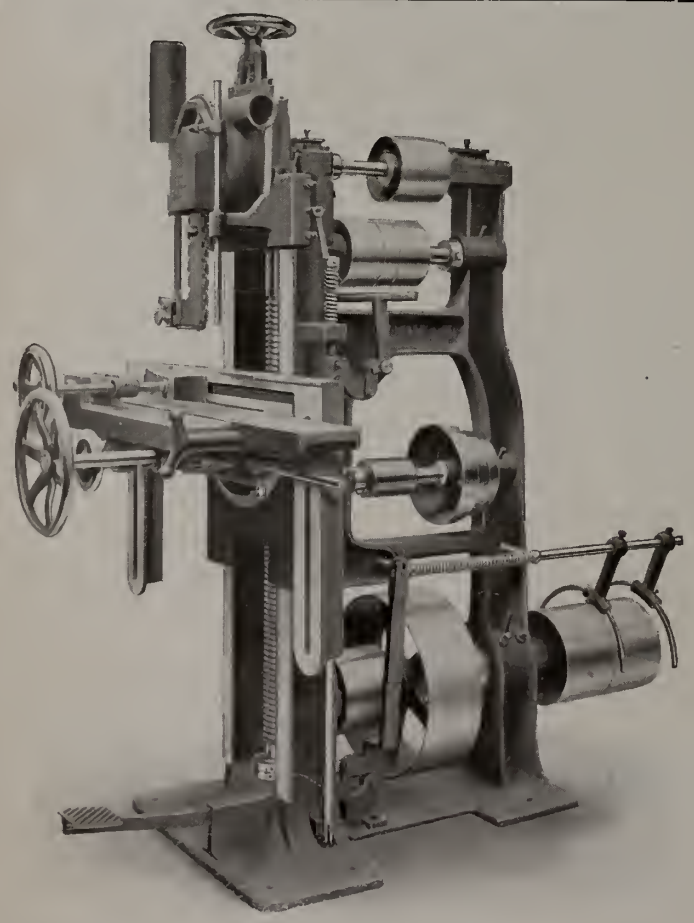


COWAN
236
Chain Saw Mortiser

The best on the market today. Rapid, free from noise and vibration.

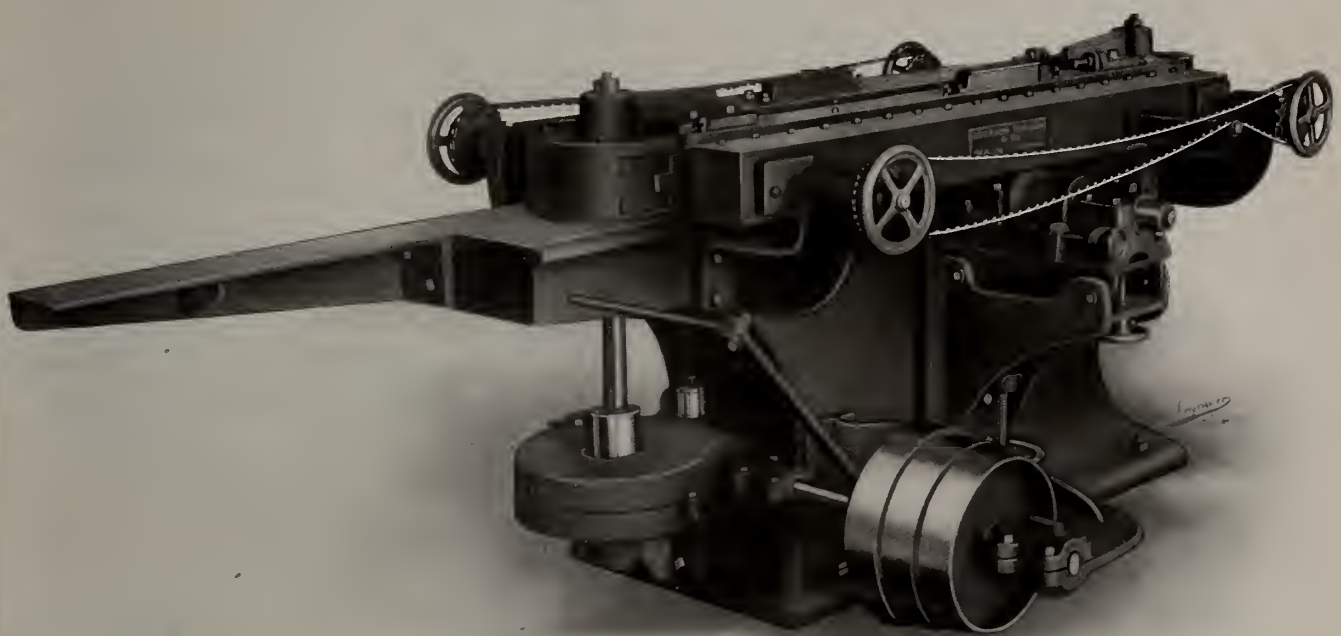
Hans Renold (English) Make Chains, Bars and Sprockets in stock.

Cowan & Company
of Galt, Limited
GALT - CANADA

Will do the work of Five Hand Jointers in making Glue Joints

This is the guarantee given with our

No. 4 Continuous Feed GLUE JOINTER



Strongest and most complete machine on the market.
Any part may be readily removed or renewed.
Feeds in opposite direction, giving 100 feet per minute.
Works material from six inches up to any length desired.
Also from one quarter to 3 inches thick, and from three-quarters of an inch wide up to any width.
1 set Shimer Special Jointer Heads supplied with machine.

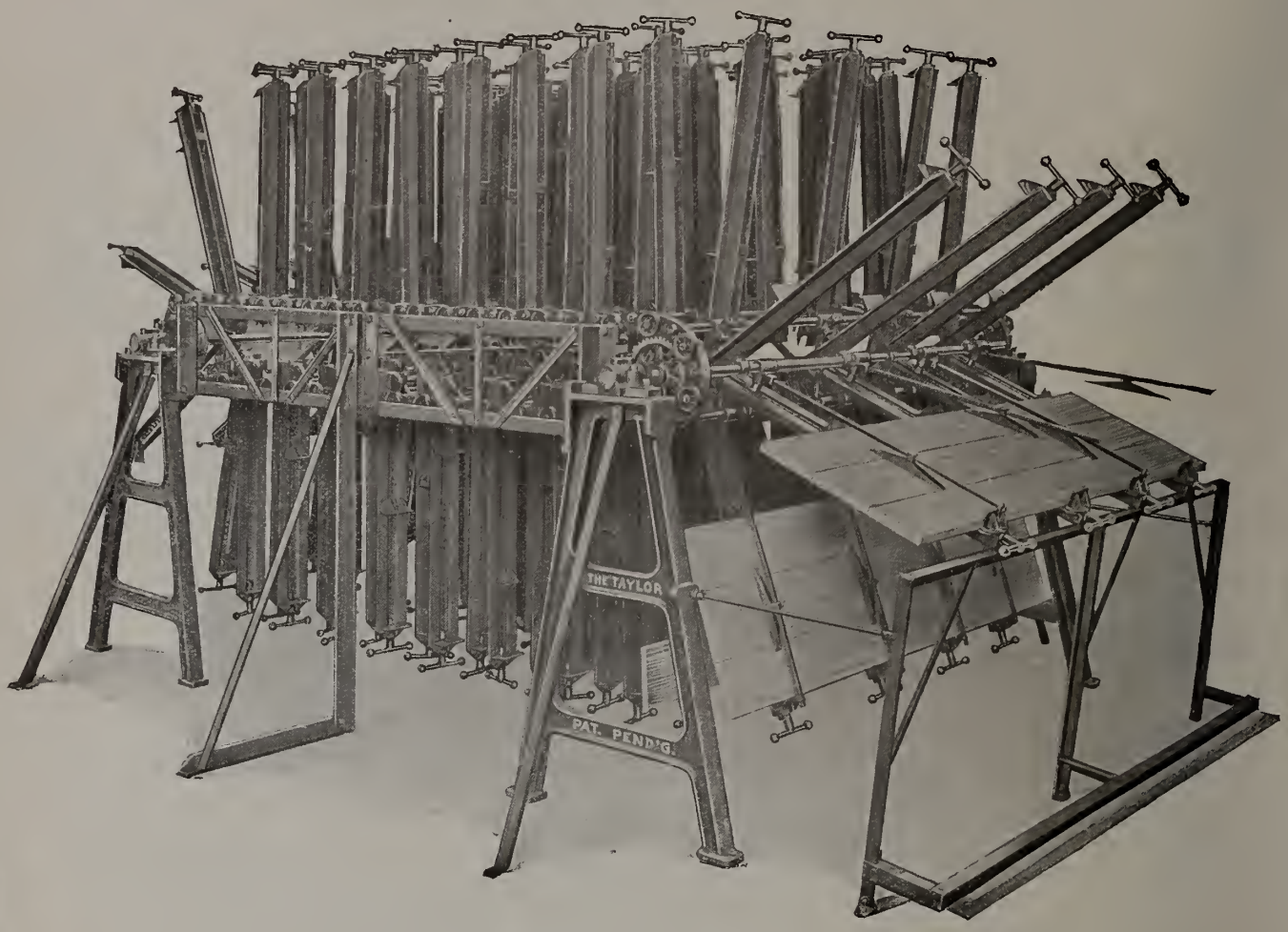
Investigate the merits of this machine—it will pay you!

Jackson, Cochrane & Company

KITCHENER - CANADA

CLAMP The Taylor CARRIER

REG. U.S. PAT. OFF. TRADE MARK



Forty section machine carrying 160 clamps, measuring 8 ft. 2½ in. between shaft centers.

The clamp is one of the most interesting features of the clamp carrier. A remarkable strain can be applied with greatest ease; the work it turns out—both thick and thin stock—is 100 per cent. perfect.

An Engineering concern recently wrote:

"I am recommending Taylor clamps to the Germain Mfg. Co. because I have proven the clamps more efficient through scientific time studies on both and all existing types of gluing-up machines and devices."

As a result of the above recommendations, The Germain Mfg. Co. referred to bought two Taylor carriers. They installed them, and tested them and have since purchased two more. We can tell you numerous instances where customers are using from two to nine Taylor carriers each as a result of similar experiences.

Let us prove the truth of these claims by showing you one of these carriers in operation, or you can try the clamps out on your own work. Ask for C. C. Folder and further information.

A. R. Williams Machinery Co., Toronto, Canada — Representatives

James L. Taylor Manufacturing Co.

POUGHKEEPSIE, N. Y.

Even if Fuel Didn't Cost Anything in Your Plant

—that would not be a sufficient reason for continuing the use of ordinary hangers equipped with friction-production plain bearings.

For, in addition to wasting fuel by destroying at least 25 per cent. of your power, hangers with plain bearings demand frequent renewals, require heavier belting, have an unusually high maintenance cost, and are very wasteful of lubrication.

You can largely eliminate the many losses due to plain bearings and make a dividend-paying investment by installing S K F BALL BEARING HANGERS. They permit the shaft to ride almost frictionless not only when well aligned but under extreme conditions of misalignment. The inner race tilts with the shaft—the bearing can never bind.

Because they are practically wear free, S K F Ball Bearing Hangers, besides saving a large percentage of your power, have a much longer life, a lower maintenance cost, and save materially in lubrication.

Canadian S K F Company Limited

Montreal Toronto

SKF INDUSTRIES

Hess-Bright Ball Bearings
S K F Ball Bearings
Atlas Steel Balls
Gronkvist Chucks
Transmission Hangers

A Service that contemplates more than the sale of a bearing

Every S K F Industries Service-salesman is a plant engineer equipped to consult on your power transmission problems. S K F Service made available through these men is built on a laboratory-backed ideal that seeks to increase Canadian output by lifting the friction load from industrial machinery.

Manufacturers are invited to avail themselves of this freely offered co-operation.

The S K F Research Laboratories where friction problems are solved

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Don't Overlook this Opportunity

We have just been authorized to sell the high grade equipment in the plant of Messrs. Siemon Bros., Wiarton. The machinery in this plant is of a very high order and has been kept in very satisfactory condition. We list a few items below:

10 Lightning 638 C.M.C. Cut Off Saws.
1 Straight Edge Band Re-Saw.
1 Power Feed Gang Edger Saw and Ripper with countershaft, extension table, only three saws.
1 Power Driven Winch for hauling the cars out of kiln, with about 100 ft. of ¾ in. wire rope.
1 Improved Cutter Head Grinder.
1 Filing Stand and Tracker.
1 42 in. Automatic Knife Grinder.
1 Double End Bench Emery Stand or Grinder.
1 Automatic Saw Gummer.
4 Heavy Lightning Flooring Machines.
1 Flooring Trimmer or Equalizer with End Matching Attachment.
1 End Matcher.
1 Smith Hot Blast Apparatus, consisting of fan, pipe, coils, steel casing, etc.
1 Wheelcock Engine about 200 H.P.—wheel about 14 ft. x 48 in.
1 Simplex Steam Pump, about 6 in. steam cylinder.
1 Closed Feed Water Heater, 24 in. x 6 ft. with 7 in. exhaust opening.
2 Horizontal Return Tubular Boilers, 64 in. dia. x 14 ft. long, each with 80 3½ in. tubes. Heads are ½ in. thick; have 32 stays in each head, each with full flush front, herring-bone grates and standard list of fittings.
1 Double Steel Plate Shaving Exhaust Fan 54 in. size, with 18 in. outlet.

Also Shafting, Drop and Post Hangers, Pulleys, Belting, Warehouse Trucks, Etc.

WRITE FOR PRICES AND COMPLETE LIST.

The A. R. Williams Machinery Co., Limited

HEAD OFFICE - TORONTO, ONT.

St. John, N.B. Halifax, N.S. Montreal, P.Q. Winnipeg, Man. Vancouver, B.C.

Two years' experience adds weight to this opinion

"we have found this machine very satisfactory"

That is what a prominent shop in Pittsburg says about

THE "OLIVER" No. 61
SINGLE CYLINDER SURFACER

They have had this machine in use over three years. The machine is shown here putting an extra-smooth surface on 10-inch boards. Rate of feed 33 feet per minute. Depth of cut ⅛-inch. Three hundred pieces are finished per hour to the dimensions shown.

The "Oliver" Surfacer

will do equally well for you. Investigate it. Get our catalog and complete description of this and many other Oliver "Medal" Wood-working Machines.

Finished Size 1¾x10-in.x6-ft.
Rough Size 2x10-in.x6-ft.

Highest Award, Paris, 1900.

Over twenty years of steady progress in building Wood-working Machinery of Quality.

Oliver Machinery Co.

Grand Rapids, Mich., U.S.A.

N. Y. Medal for Safety Guards and appliances

STRONG AS THE ROCK

TRADE MARK
MONITE
WATERPROOF GLUE

Made Under U.S. patent

Representatives and stocks at:—

CHICAGO
DETROIT
ST. LOUIS
MINNEAPOLIS
SAN FRANCISCO
TORONTO, CANADA

Monite Waterproof Glue

represents proved superiority. MONITE satisfies all the requirements in glue, namely:

Strength Uniformity Dependability Heat and Water Resistance
Unchanging Adhesion in All Weathers and Climates.

The product of years of research and experiment, MONITE offers new and greater value—the best waterproof glue obtainable in America. It can be adopted with confidence in every branch of the woodworking industry.

Write for our booklet - let us submit prices and samples.
Our skilled demonstrators are at your service.

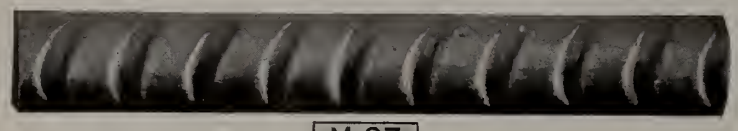
CASEIN GLUE MANUFACTURING CO.

General Sales Office
136 W. Lake St., Chicago, Ill.
Successors to Certus Cold Glue Co.
Detroit

W. H. Gage Glue Co.
Distributors for South & West
St. Louis, San Francisco

Canadian Distributors
W. H. Cunningham Co.
Toronto, Can.

MONITE WATERPROOF GLUE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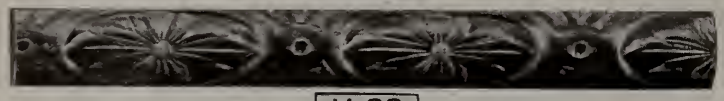
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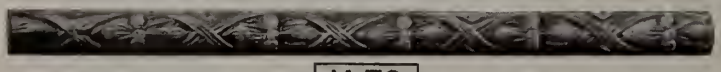
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MOULDINGS We are making more Period Mouldings than ever before. Orders should be placed early to assure your supply when needed.

KNOBS The Period Knobs we placed on the market a few months ago are proving very popular. If you have not received samples ask for them now.

ROSETTES A new Period item to accompany the knobs.

OP8

OP5

OP6

Waddell Manufacturing Company

Coldbrook and Taylor, N. W. **Grand Rapids, Mich.**

EAGLESFIELD

"Beltless" Swing Saw

Adaptable to close, accurate work

The "Eaglesfield" is the result of very careful study of swing saw requirements, and is designed with a special view to economy, reliability of operation and compactness.

This saw is operated by a specially designed and rated four-horsepower motor, the transmission being direct to the saw mandrel through a set of bevel gears, both saw mandrel and motor shaft being supported in S.K.F. ball bearings.

The hanger is of unified construction to insure rigid support and eliminate vibration. A rocker coil spring is provided instead of the ordinary counter balance weight.

The motor which is mounted in, and forms part of the head, is supplied in 60 cycles, either 2 or 3 phase, and any standard voltage. Speed of motor is 3,600 R.P.M.

One circular saw, which will cut five-inch stock, is included with each machine.

WRITE FOR BOOKLET

R. D. Eaglesfield

21st and Norwestern Avenue

Indianapolis, - Indiana

Keep the Pot Boiling

Remember—a big business revival is just around the corner. If you need a new Boiler order it now. Don't be caught napping. It takes a reasonable time to build Boilers right, the way we do it. Let us have your inquiry **now**.

Engineering and Machine Works of Canada, Limited

St. Catharines, Ont.

Eastern Sales Offices:
Hall Machinery Co., Sherbrooke Que., ar d Birk's Bldg., Montreal.

BEAVER DADO

"BEAVER"

A line of saws for the woodworking and manufacturing industries that embody all that quality of material and good workmanship stand for.

Beaver Saws give long, efficient service and are holding a high position in the estimation of plant owners throughout the Dominion.

JUST TELL US YOUR SAW REQUIREMENTS

Radcliff Saw Manufacturing Company, Limited

1550 Dundas Street West **TORONTO, ONT.**

Efficient service is the keynote of membership of the

CANADIAN WOODWORKER and Furniture Manufacturer

—IN—

Canadian National Newspapers and Periodicals Association

—a highly constructive service—absolutely dependable and devoid of prejudice and personal bias. It means much to you!

The policies and principles back of this important service enable you to secure practical and impartial information of great value in business and in the home: and they assure a ready fund of literature of exceptionally high standard at all times.

To read the Association's Standards of Practice listed herewith is to understand what this Association means to you.

Standards of Practice

Canadian National Newspapers and Periodicals Association

THE Members of this Association shall dedicate their best efforts to the cause of business, and public service, and to this end shall pledge themselves:

1. To consider first the interests of the Subscriber.

2. To work for truth and honesty in all departments.

3. To eliminate, in so far as possible, their personal opinions from their news columns, but be leaders in thought in their editorial columns, and make their criticisms constructive.

4. To refuse to publish puffs. free reading notices, or paid write-ups, to keep their reading columns independent of advertising considerations, and to measure all news by the standard "Is it real news?"

5. To decline any advertisement which has a tendency to mislead, or which does not conform to business integrity.

6. To solicit subscriptions and advertising solely upon the merits of the publication.

7. To supply advertisers with full information regarding character and extent of circulation, including detailed circulation statements, subject to proper authentic verifications.

8. To co-operate with all organizations and individuals engaged in creative advertising work.

9. To avoid unfair competition.

10. To determine what is the highest and largest function in the field which they serve, and then to strive in every legitimate way, to promote that function.

This is Number One of a series of advertisements regarding an Association that typifies thorough-going Canadian stability.

Canadian National Newspapers and Periodicals Association

Office - 70 Lombard Street - Toronto, Ontario

HART MIRROR PLATE CO.

IMPORTERS AND MANUFACTURERS OF

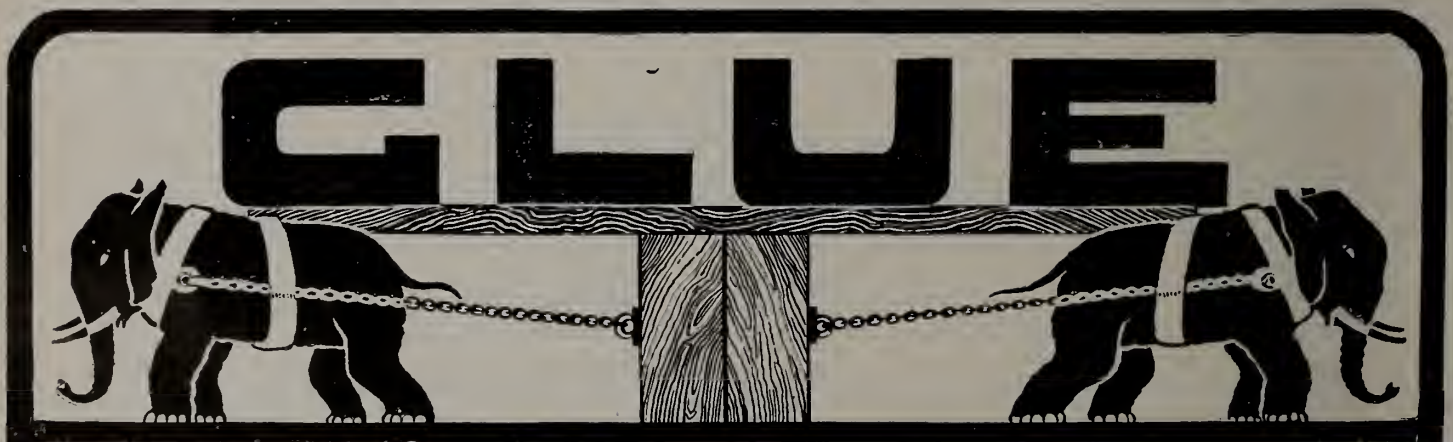
MIRRORS

GRAND RAPIDS QUALITY

Grand Rapids, Mich.

A great many Hart craftsmen have made Hart Quality Mirrors for 20 years. Moreover, they learned their trade in Europe. Old World skill with New World methods means Grand Rapids Quality Mirrors at quantity production prices. Hart Mirrors are finely finished in every respect and shipped with unusual promptness.

Makers of Highest Grade Mirrors and Plate Glass Tops Since 1900



FOR THE FINEST CABINET WORK AND VENEERING.

Suitable for All Climates.
Great Strength & Light Colour.

SAMPSON & WHITE, Ltd.

6, HOLBORN VIADUCT, LONDON, E.C.

"CASCO" Waterproof Glue

Mixed Cold—Used Cold

COST

FOR JOINTING—very much less than the hide glues.

FOR VENEERING—A little more per pound than vegetable, but little, if any, more per GLUE LINE FOOT.

Hundreds of large manufacturers are using "CASCO" to produce the BEST veneered products, at no increase in cost.

The Casein Manufacturing Co.

Manufacturers of Casein Glues for twenty-five years

15 PARK ROW NEW YORK CITY

NOTE. Send for Casco Red Book. It contains much information on glue, veneer and panels.

Improved Glue Heater

No heat controllers or other safety guards are necessary with this heater, **because it cannot injure glue.** It's simple, substantially made of copper and costs less than any other.

Let us tell you more about it.

We make any size desired.

Cincinnati Glue Heater Company

Cincinnati, Ohio

Built on Fireless Cooker Principle

"INTERNATIONAL" Electric Glue Heaters

like the fireless cooker are built on the principle of retaining heat.

There is no water bath to boil dry and cause burnouts on the International.

Even dry heat means more accurate temperature control and a lower energy consumption.

The quart pot operates at an average cost of one cent per day.

Over 10,000 satisfied users

Write for folder, "Correct Temperature in the Glue Room."

INTERNATIONAL ELECTRIC COMPANY

MANUFACTURERS

ELECTRICAL HEATING APPLIANCES

INDIANAPOLIS, U.S.A.

Canadian Distributors

R. E. T. PRINGLE, Limited

TORONTO
95 King Street East

MONTREAL
401 New Birks Bldg.

WINNIPEG
703 Confederation Life Bldg.

VANCOUVER
402 Vancouver Block

"International Electric Heaters are Better."

QUICK REPAIR

Is a material very desirable for use by woodworking manufacturers of all kinds and is used for repairing splits, checks and other defects in both surface and core stock?

Made in colors to meet the requirements of the best finishes of all cabinet woods.

Put up in tubes for convenient use on surface stock and in quart cans for larger defects in core stock.

Quick Repair has been used by some of our customers for a number of years.

Small sample tube mailed free on request.

Manufactured and sold exclusively by
Makers of

PERKINS
183

Trade Mark Reg. U.S. Pat. Off.

Perkins Glue Company

Factory and General Offices:
Lansdale, Pennsylvania.

Sales Office:
South Bend, Indiana

These Products Help Make Good Furniture.

Select FIBRECORD is a first quality material for all kinds of Fibre Furniture. May be had with plain or wire centers.

STAKES

Stiff stakes are made for all kinds of weaving from A-1 material. These stakes may be had with or without wire centers.

UNAFLEX SEAMING CORD

is an everlasting cord for upholstered furniture. Used by many and pronounced highly satisfactory.

Select UNIFORM STRONG

Fibre Cord

Smooth, extra hard surface of Select Fibrecord makes it unexcelled for furniture work.

It takes but little finishing materials and gives strength and rigidity to the finished article.

Very different from cheap, soft cord, which gives rough surface and absorbs finishing materials.

Select Fibrecord is carefully tested for strength and uniformity.

Write for Samples and Prices.

GRAND RAPIDS FIBRE CORD CO.

Myrtle Street and P. M. R. R. GRAND RAPIDS, Mich.

Perkins Vegetable Glue

The Glue of No Regrets

This Picture is the Home of

PERKINS 183

TRADE MARK (Reg. U.S. Pat. Off.)

Our Canadian Factory is located at Hamilton, Ont.

Process and Product Patents covering Perkins Glue were granted July 2nd and March 19th, 1912, and have been held valid and infringed by the United States Circuit Court of Appeals. Patents have also been granted in Canada, Great Britain, Germany, France, Belgium, Italy and other foreign countries.

PERKINS GLUE COMPANY

Factory and General Offices:
Lansdale, Pennsylvania

Sales Office:
South Bend, Indiana

Do Not Gamble on Your Veneer Tapes

BUY THE BEST.

Ideal Veneer Tapes

The material with the guarantee behind it

Profit by our many years' careful application to the subject of Veneer Tapes.

We have several qualities, cloth and paper, plain and perforated, which will cover all of your requirements.

Write for booklet.

IDEAL COATED PAPER CO.

Veneer Tape Specialists

Main Offices and Mills, BROOKFIELD, Mass.

MAGIC VENEER TAPE

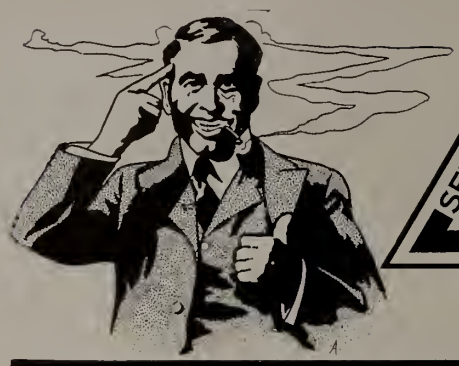
is made of highest quality Kraft Paper that peels off your veneer in one piece, thus eliminating that tedious and expensive work of sanding or scraping.

YOUR especial needs of Veneer Tapes, whether Paper or Cloth, can be furnished by

The Gummed Products Co.

Troy - Ohio

Chicago Minneapolis New York



NASHUA: That's the Idea!

A bright idea that's sure to come your way sooner or later, is

NASHUA Veneer Tapes

STICK TIGHT

FURNITURE MANUFACTURERS do not have any trouble making Nashua Veneer Tapes stick because they are made of strictly number one grade stock, combined with an extra heavy coating of glue.

Send for free samples, (cloth or paper). Wet them, apply them, and watch them stick. You'll be surprised.

CANADIAN·NASHUA·PAPER·CO·LTD
TRADE MARK
PETERBOROUGH ONT.

CANADIAN NASHUA PAPER CO., Ltd.

Peterborough, Ont.

An Efemco Product

---In Great, Consistent and *Growing* Demand

That's the Acme Grip Neck Caster, a worthy EFEMCO Product.

A caster that combines utility and durability with *appearance.*

It has compact, sturdy rollers and strong axles. And its graceful lines sacrifice not a whit of stamina or endurance.

It is a light caster in weight, entirely lacking in bulk. The buyer of fine furniture quickly recognizes the merits of such a caster. Hence its growing popularity.

EFEMCO Casters are made in a good variety of sizes and with splendid, durable finishes—for all styles and grades of furniture.

Write for catalog showing new lines of improved EFEMCO Casters.

FOSTER, MERRIAM & CO.

Meriden, Conn. Hamilton, Ontario New York City

Efemco PRODUCTS

Grip Neck Casters
Ball Bearing Casters
Roller Bearing Casters
Truck Casters
Furniture Trimmings
Automobile Accessories
Piston Rings
Grey Iron Castings

Standardized by 85 years of service

Efemco Products Efemco Products Efemco Products Efemco Products Efemco Products Efemco Products

Reese Sheriff Lumber Co.

WILLIAMSPORT, PENNSYLVANIA

Manufacturers of

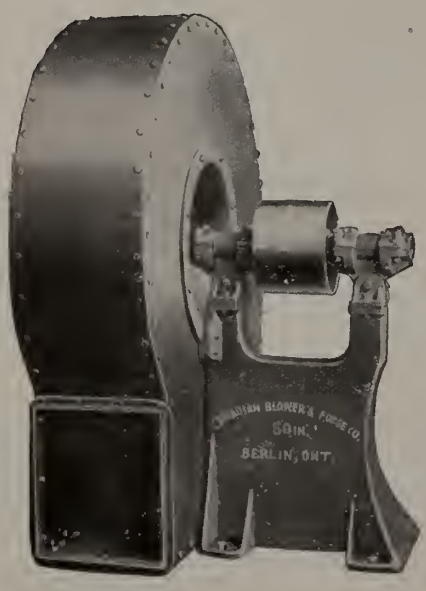
Northern and Southern Hardwoods White Pine, Spruce and Hemlock

With special attention to **Oak, Chestnut, Poplar, Cherry, Walnut, Gum and Basswood.**

OUR MOTTO

REASONABLE PRICES—that you can afford to pay.
EFFICIENT SERVICE — that you have a right to expect
FAIR TREATMENT — that you can depend on getting

We would appreciate an opportunity of furnishing a portion of your lumber requirements.



Canadian Planing Mill Exhauster

Keep your shop clean, remove your sawdust, shavings, or other loose material.

A clean shop with machines free from shavings, chips or sawdust makes for greater efficiency.

Let our engineering department help you plan your refuse exhaust system.

Write for Catalogue 400-13

Canadian Blower & Forge Co.

KITCHENER, ONT.

ESTABLISHED 1867 OTIS TRADE MARK INCORPORATED 1886

MAHOGANY
The King of Woods

The above photograph shows many thousands of feet of this regal lumber in our yards. Hewn from the jungles of the tropics, escorted along many miles of inland river to the sea, by chattering, singing black men, then shipped to our mills; this, in brief, is the story of the King of the woods—Mahogany.

WE ARE MANUFACTURERS AND IMPORTERS OF

Tabasco, Laguna, Honduras, and Mexican Mahogany

The Otis mills have a capacity of 12,0000,000 feet per year. This assures our customers that we possess an adequate supply. Write for our quotations.

Otis Manufacturing Company

Peters Avenue and The River

NEW ORLEANS, LA.

Chicago Office: 175 W. Jackson Blvd.

L. D. LEACH & COMPANY

FISHER BUILDING, - CHICAGO, Ill.

Manufacturers Hardwood Lumber

6 Cars 4/4 No. 1 Common Red and White Oak
5 Cars 4/4 No. 2 Common Red and White Oak
4 Cars each 8/4 in. No. 1 and No. 2 Com. R. and W. Oak
2 Cars each 10/4 in. and 12/4 in No. 1 and No. 2 Common Red and White Oak

Oak Furniture — Vehicle and Car Stock Dimensions Sawed to Order

4/4 in. Gum—All Grades
4/4 in. Cypress—All Grades
4/4 in., 8/4 in. and 10/4 in. Log Run Soft Elm

HARDWOOD LUMBER

Thirteen Band Mills
Six Planing Mills
Eleven Flooring Units

Annual Capacity, 130,000,000 Feet

OAK LUMBER

OAK is called "The World's instinctive symbol of **Strength, Endurance** and **Dignity.**"

OAK is described as "The Silent Partner of Architecture and the Arts, throughout history.

OAK is the standard for all comparisons of other woods, used or sought to be used, in the same fields of consumption.

OAK is the finest, most durable, most satisfactory cabinet wood in the world.

OAK has its competitors, but for these competitive woods it cannot be claimed that they are better than oak. For some it is claimed that they are "just as good," that they are cheaper, that they can be made to sail under false colors, by imitating expensive, desirable woods; but oak has stood for ages upon its own merits of quality, of substance, texture, beauty, durability.

Of course all oak is not of equal desirability. Oak that grows intermingled with soft woods is less valuable than that produced from a pure hardwood area.

Generally speaking the thicker the stand of oak the better the quality—the more perfect the texture.

Our hardwood forests in the Appalachian area are unexcelled.

The actual cut of our sawmills in this territory shows that our stand of oak is from 30% to 65% of the total stand of the timber—figures which brand our production of oak as in a class by itself. So perfect is the oak timber in some of this area that 25% of the total production of oak lumber is 1's and 2's and 23% No. 1 Common.

Many dealers and users who have once used our oak prefer to purchase only our manufacture.

With such SUPERIOR LUMBER and the EFFICIENT SERVICE we render, we can adequately supply every need of all our customers.

W. M. Ritter Lumber Co., Columbus, Ohio

Canadian Representative: **John Hall, 160 Huron St., Post Office Box 32, Toronto**

Mercerau-Hawkins Tie Company

Huntington - W. Va.

Manufacturers and Wholesale Dealers

West Virginia and Southern

HARDWOODS

We specialize in

Oak Tie Siding
White and Red Oak
Yellow Poplar
Basswood
Chestnut and
Gum Lumber.

Canadian Sales in Charge of

C. W. PETERS

Vice President and Manager of Lumber Dept.

RUSH LUMBER COMPANY

Manufacturers Southern Hardwoods

Band Mill and Office - Memphis, Tenn.

	ASH		HICKORY
2,000′	6/4 No. 3 Com.	10,000′	6/4 No. 3 Com.
2,000′	8-10-12/4 No. 3 Com..	8,000′	6/4 Log Run
18,000′	5/4 Log Run		SOFT MAPLE
5,000′	6/4 Log Run	2,000′	4/4 Log Run
	CHERRY	200′	8/4 Log Run
500′	4/4 Log Run	2,000′	12/4 Log Run
	COTTONWOOD		QUARTERED WHITE OAK
8,000′	4/4 FAS	12,000′	4/4 FAS
20,000′	4/4 No. 1 & 2 Com.	11,000′	5/4 FAS
3,000′	5/4 & 6/4 No. 3 Cm.	3,000′	6/4 FAS
	CYPRESS	100,000′	4/4 No. 1 Com.
15,000′	4/4 Shop & Btr.	30,000′	5/4 No. 1 Com.
	ELM	12,000′	6/4 No. 1 Com.
11,000′	6/4 No. 3 Com.	15,000′	4/4 No. 2 Com.
15,000′	6/4 Log Run	4,000′	5/4 No. 2 Com.
11,000′	8/4 Log Run	4,000′	6/4 No. 2 Com.
14,000 ′	12/4 Log Run	8,000′	4/4 Clear Strips.
	RED GUM	10,000′	4/4 No. 1 C. Strips.
5,000′	4/4 FAS.	2,000′	4/4 No. 2 C. Strips.
12,000′	5/4..No. 1 Cm. & Br.		PLAIN WHITE OAK
18,000′	4/4 No. 1 Com.	3,000′	4/4 FAS
20,000′	4/ No. 2 Com.	40,000′	4/4 No. 1 Com.
	SAP GUM	40,000′	5/4 No. 1 Com.
7,000′	4/4 13 to 17 FAS	25,000′	4/4 No. 2 Com.
15,000′	4/4 6 to 12 FAS.	12,000′	5/4 No. 2 Com.
8,000′	5/4 FAS	14,000′	4/4 S.W.
3,000′	5/4 13 and up FAS.	15,000′	4/4 No. 3 Com. ....
30,000′	4/4 No. 1 Com.	12,000′	5/4 & 6/4 No. 3 Com.
40,000′	4/4 No. 2 Com.		PLAIN RED OAK
21,000′	5/4 No. 2 Com.	15,000′	4/4 FAS.
25,000′	4/4 No. 3 Com.	70,000′	3/4 No. 1 & Btr.
21,000′	5/4 & 6/4 No. 3 Com	30,000′	5/4 No. 1 & Btr.
	BLACK GUM	75,000′	4/4 No. 1 Com.
12,000′	4/4 FAS Qtd.	20,000′	4/4 No. 2 Com.
30,000′	4/4 No. 1 Com. Qtd.		POPLAR (ROUGH)
12,000′	4/4 No. 2 Com. Qtd.	8,000′	4/4 FAS
14,000′	4/4 Log Run Plain	10,000′	4/4 Saps.
	SYCAMORE	20,000′	4/4 No. 1 Com.
7,000′	4/4 No. 3 Com.	22,000′	4/4 No. 2 Com.
25,000′	4/4 Log Run	3,000′	4/4 No. 3 Com.
	QUARTERED RED GUM	6,000′	5/4 & 6/4 No. 3 Cm.
15,000′	4/4 FAS.		QUARTERED RED GUM
5,000′	8/4 FAS		S. N. D.
30,000′	4/4 No. 1 Com.	15,000′	8/4 No. 1 Com. & Btr.
11,000′	8/4 No. 1 Com.	16,000′.	12/4 No. 1 Com. & Btr.

Dacus-Richards Hardwood Co.

A. P. DACUS - H. J. RICHARDS

MANUFACTURERS

Southern Hardwood

Specializing in

RED GUM
SAP GUM

PLAIN AND QUARTERED

OAK

Randolph Building,

Memphis, Tennessee.

Mills at EVANSVILLE, Miss., and PRITCHARD, Miss.

Perkins Brothers

Kelso, Ark.

Manufacturers of

Southern Hardwoods

Quartered and Plain White Oak, Plain Red Oak, Gum Elm, Maple, Ash and Cypress

We are also prepared to cut dimension stock to order in Ash, Oak, Gum, Hickory and Elm.

Let us know your requirements.

Brown & Hackney, Inc.

MEMPHIS, TENN.

BAND MILL: LITTLE ROCK, ARK.

Manufacturers of High Grade

Band Sawn Southern Hardwood

LUMBER

General Office:

Bank of Commerce Bldg. Memphis, Tenn.

January 1921—Stock List

QUARTERED WHITE OAK

2 cars	5/8″	No. 1 Common
2 cars	4/4″	1s&2s
5 cars	4/4″	No. 1 Common
2 cars	4/4″	No. 2 Common
2 cars	4/4″	Common Strips
7,000′	6/4″	No. 1 Common
8,000′	8/4″	No. 1 Common & Better
1 car	8/4″	No. 2 Common

PLAIN RED OAK

1 car	3/4″	1s&2s
2 cars	3/4″	No. 1 Common
1 car	3/4″	No. 2 Common
2 cars	4/4″	No. 1 Common
2 cars	4/4″	No. 2 Common

PLAIN WHITE OAK

1 car	4/4″	1s&2s
4 cars	4/4″	No. 1 Common
2 cars	4/4″	No. 2 Common

MIXED OAK

3 cars	3/4″	No. 3 Common
4 cars	4/4″	No. 3 Common
2 cars	4/4″	Sound Wormy
1 car	3/4″	Sound Wormy

BLACK GUM

3,000′	3/4″	No. 1 Common & Better Plain
2 cars	4/4″	No. 1 Common & Better Plain
2 cars	8/4″	No. 1 Common & Better Quartered

QUARTERED RED OAK

6,000′	8/4″	No. 2 Common & Better

PLAIN SAP GUM

3 cars	5/8″	No. 1 Common & Better
2 cars	5/8″	No. 2 Common
2 car	4/4″	No. 2 Common
2 cars	6/4″	& 8/4″ Dog Boards

QUARTERED RED GUM SAP NO DEFECT

3 cars	4/4″	No. 1 Common & Better
3 cars	5/4″	No. 1 Common & Better
5 cars	6/4″	No. 1 Common & Better
5 cars	8/4″	No. 1 Common & Better

PLAIN RED GUM

3 cars	4/4″	No. 1 Common & Better

QUARTERED RED GUM

2 cars	4/4″	No. 1 Common & Better
2 cars	6/4″	No. 1 Common & Better
2 cars	8/4″	No. 1 Common & Better

MISCELLANEOUS

2 cars	4/4″	No. 1 Shop Cypress
1 car	6/4″	No. 2 Common Elm
1 car	4/4″	Common & Better Cottonwood
1 car	4/4″	Log Run Sycamore

Wire or write for delivered prices. We can make immediate shipment on RUSH orders. Can load same day as we receive shipping instructions.

MEMPHIS BRUCE LITTLE ROCK

ARKANSAS HARDWOODS

The high standards in raw material and manufacturing equipment, which are responsible for the excellent nation-wide reputation of Bruce Oak Flooring, also prevail in the conduct of our hardwood operations.

BAND SAWN

RED and WHITE OAK

ASH · GUM

We can ship Oak Flooring, trim and moldings with hardwood lumber.

CORRESPONDENCE INVITED

THE E. L. BRUCE COMPANY

Manufacturers

LITTLE ROCK, ARKANSAS

BEDNA YOUNG
Lumber Company
Jackson - Tennessee

Manufacturers of

Quartered White Oak
Quartered Red Oak
and Other Hardwoods

When in the market for
High Grade Lumber
please let us have your enquiries.

Sawed Veneer

Quartered White Oak
For Furniture and Panels

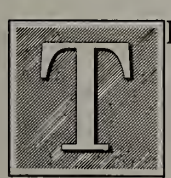
Plain Red Oak
For Interior Trim and Doors

Cypress
For Battery Separators

Manufacturing Uniformly Good.
Quality Unsurpassed

James E. Stark & Co., Inc.
MEMPHIS, TENN.

Are You Prepared For a Lumber Famine?



THE present situation among manufacturers, according to market reports, shows that Hardwood Stocks are far short of normal.

To those in close touch with the Lumber industry, there are positive signs pointing to a change in the lumber situation —values are bound to stiffen.

Prices are now at rock-bottom—this will not last. A sudden demand will shoot prices up again.

Just look over YOUR requirements for Birch, Basswood, Hard Maple, or Elm, now—and get quotations from us without delay.

Sawyer Goodman Company
Marinette - Wisconsin

Stimson Veneer and Lumber Co.

(Inc.)

Office and Mill: McLean Ave. and Union Belt R.R.

Memphis - Tenn.

We sell only the product of our own mills and make band sawn lumber in all Southern Hardwoods.

We specialize in Quartered White Oak, Red Oak, and Red Gum.

With allied companies we make fifty million feet annually.

J. V. Stimson Hardwood Co.

Manufacturers and Exporters

Band Mills: Memphis, Tenn., Helena, Ark.

Memphis - Tenn.

STOCK LIST

QUARTERED WHITE OAK
- 3 cars 4/4" 1s and 2s.
- 5 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common .

QUARTERED RED OAK
- 5 cars 4/4" 1s and 2s.
- 10 cars 4/4" No. 1 Common.
- 4 cars 4/4" No. 2 Common.
- 2 cars 6/4" No. 1 Common and Better.

QUARTERED RED GUM
- 10 cars 4/4" 1s and 2s.
- 3 cars 4/4" 1s and 2s Fig.
- 2 cars 5/4" 1s and 2s.
- 2 cars 6/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 2 cars 5/4" No. 1 Common.
- 2 cars 6/4" No. 1 Common.

QUARTERED RED GUM, Sap no Defect
- 5 cars 6/4" No. 1 Common and Better.
- 10 cars 8/4" No. 1 Common and Better.

ASH
- 4 cars 10/4" No. 1 Common and Better.
- 1 car 12/4" No. 1 Common and Better.
- 1 car 6/4" No. 1 Common and Better.
- 2 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common.

SAP GUM
- 10 cars 4/4" 1s and 2s.
- 20 cars 4/4" No. 1 Common.
- 10 cars 4/4" No. 2 Common.
- 2 cars 4/4" 18" up Panel.
- 5 cars 4/4" 13-17" Box Boards.

PLAIN RED OAK
- 2 cars 4/4" 1s and 2s.
- 2 cars 6/4" No. 1 Common and Better.
- 2 cars 10/4" No. 1 Common and Better.

PLAIN WHITE OAK
- 4 cars 4/4" No. 1 Common Plain.

COTTONWOOD
- 2 cars 4/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 5 cars 4/4" No. 2 Common.

ELM
- 2 cars 4/4" Log Run.
- 10 cars 10/4" Log Run.
- 10 cars 12/4" Log Run.

MAPLE
- 4 cars 12/4" Log Run.

TOPS
PANELS
TRADE
MARK
Typical of GORHAM care, skill and creative ability is this piece of GORHAM desk bed construction
Gorham Brothers Company
Mount Pleasant, Michigan

ABOVE are reproduced a few of the members of the Gorham organization who are helping to maintain the quality standard and who are pushing production on a quantity basis.

The dependability of Gorham built-up stock is something that the entire organization is proud of and likewise something that the furniture manufacturers who buy from us have learned to rely upon.

Gorham Brothers Company

Mount Pleasant, Michigan

Band Sawn Poplar, Plain and Quartered White and Red Oak— Quartered Red Gum, Sap No Defect

Below we offer, subject to prior sale and immediate acceptance, the following stock:—

ASH		
4/4"	Log Run	20,000 ft.
5/4"	Log Run	1,500 "
6/4"	Log Run	1,200 "
8/4"	Log Run	3,000 "
BASSWOOD		
4/4"	No. 2 Com. & Btr.	35,000 "
BEECH		
4/4"	Log Run	10,000 "
5/4"	Log Run	30,000 "
6/4"	Log Run	12,000 "
8/4"	Log Run	40,000 "
10/4"	Log Run	10,000 "
12/4"	Log Run	3,000 "
CHERRY		
4/4"	Log Run	7,000 "
COTTONWOOD		
4/4"	Log Run	10,000 "
QTRD. GUM, SND		
4/4"	No. 2 Com. & Btr.	7,500 "
6/4"	FAS	20,000 "
6/4"	No. 1 Com.	40,000 "
8/4"	No. 1 Com.	30,000 "
PLAIN SAP GUM		
4/4"	No. 1 Com.	45,000 "
4/4"	No. 2 Com.	30,000 "
5/4"	No. 1 Com. & Btr.	30,000 "
QTRD. BLACK GUM		
4/4"	No. 2 Com. & Btr.	70,000 "
PLAIN BLACK GUM		
4/4"	No. 1 Com. & Btr.	15,000 "
HICKORY		
6/4"	Log Run	2,000 "
8/4"	Log Run	12,000 "
QTRD. WHITE OAK		
4/4"	FAS	50,000 "
4/4"	No. 1 Com.	200,000 "
4/4"	No. 2 Com.	100,000 "
5/4"	Com. & Btr.	10,000 "
MAGNOLIA		
4/4"	FAS	20,000 "
4/4"	No. 1 Com.	50,000 "
4/4"	No. 2 Com.	45,000 "
QTRD. WHITE OAK STRIPS		
4/4"	Clr 2½ to 5"	13,000' "
4/4"	Com. 2 to 3"	3,500 "
PLAIN WHITE OAK		
4/4"	FAS	13,000 "
4/4"	No. 1 Com.	60,000 "
4/4"	No. 2 Com.	65,000 "
QTRD. RED OAK		
4/4"	No. 1 Com.	75,000 "
4/4"	No. 2 Com.	14,000 "
PLAIN RED OAK		
4/4"	FAS	65,000 "
4/4"	No. 1 Com.	130,000 "
4/4"	No. 2 Com.	110,000 "
5/4"	FAS	30,000 "
5/4"	No. 1 Com.	20,000 "
PLAIN OAK		
4/4"	Sound Wormy	200,000 "
4/4"	No. 3 Com.	100,000 "
QTRD. POPLAR		
4/4"	No. 1 Com. & Btr.	40,000 "
POPLAR		
4/4"	No. 1 Com.	200,000 "
4/4"	No. 2A & B Com.	220,000 "
6/4"	No. 1 Com. & Btr.	33,000 "
SYCAMORE		
6/4"	Log Run	21,000 "
WALNUT		
4/4"	Log Run	2,000 "

We own our stumpage and operate our own band mill in Bude, Miss., manufacturing ten million feet annually, on which we specialize in Quartered White Oak, manufactured from genuine forked leaf White Oak and Yellow Poplar of fine soft texture grown in the hills of Southern Mississippi.

Our grades are dependable and the manufacture of our stock is unsurpassed. We respectfully solicit your enquiries, which will receive our prompt and courteous attention.

L. D. Murrelle Lumber Company

General Sales Office: 1524 Exchange Bldg., Memphis, Tennessee

Band Mill: Bude, Miss.

Efficiency Marks Every Step of Our Service to You

Exact photograph of alley in our yard

White and Red Oak

Plain & Quarter Sawed Red Gum

Our Specialty Quarter Sawed Red Gum in Plain and Figured Wood

From the cutting to the delivery to your hands, our entire stock receives the most careful attention. All the excellence of quality and the beauty of the wood is kept just as it is when cut. When next you are in need of Oak, Ash, Elm, and Cypress of first class quality and in perfect condition write us. We can ship promptly.

BARR-HOLADAY LUMBER CO.

BAND MILL AT LOUISE, MISS. **GREENFIELD, OHIO**

SOUTHERN HARDWOODS

Dry Lumber in Buffalo for Quick Shipment

BROWN ASH

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
1 in.	30,900	.....	17,000	12,000
1¼ in.	58,500	7,300	36,200	15,300
1½ in.	36,500	.....	35,000	7,500
2 in.	4,500	.....	20,000	2,000

WHITE ASH

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
1 in.	8,000	.....	54,000	65,000
1¼ in.	117,000	4,500	140,000	40,000
1½ in.	16,900	1,200	39,000	65,000
2 in.	38,300	500	91,000	96,000
2½ in.	38,500	.....	58,000	37,500
3 in.	71,500	.....	30,500	38,500
4 in.	12,000	.....	8,000	10.500

BASSWOOD

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
1 in.	148,700	3,000	350,000	226,000
1¼ in.	130,000	14,000	277,500	97,800
1½ in.	84,600	.....	41,800	15,000
2 in.	81,900	.....	27,000	14,500
2½ in.	90,000	.....	13,900	15,000
3 in.	13,550	.....	10,500	5,900
4 in.	1,300	.....	450	.....

CHERRY

	1 & 2	No. 1 Com.	No. 2 Com
1 in.	187,500	182,200	98,500
1¼ in.	5,500	7,600	14,500
1½ in.	32,000	32,700	55,300
2 in.	.....	26,200	70,900
2½ in.	5,500	2,700	2,200
3 in.	28,700	3,500	2,300
4 in.	5,900	.....	500

CHESTNUT

	1 & 2	No. 1 Com.	S. W. No. 2 Com.
¾ in.	500	40,000	55,000
1 in.	3,900	10,300	153,500
1¼ in.	161,800	88,200	219,200
1½ in.	90,500	62,000	.....
2 in.	59,200	17,300	126,200
2½ in.	4,000	1,150	500
3 in.	2,100	1,300	500
4 in.	1,500	300	.....

CYPRESS

	1 & 2	Select	No. 1 Shop
1 in.	.....	.....	.....
1¼ in.	.....	8,800	.....
1½ in.	17,100	5,200	18,000
2 in.	7,000	11,200	4,600
2½ in.	8,000	3,200	.....
3 in.	69,400	23,100	12,000
4 in.	10,300	.....	.....

SOFT ELM

	1 & 2	No. 1 Com.	No. 2 Com.
1 in.	2,700	.....	.....
1¼ in.	41,500	38,200	6,800
1½ in.	12,500	16,300	5,400
2 in.	6,000	11,000	5,500
2½ in.	13,000	7,200	2,300
3 in.	26,280	8,500	8,000
4 in.	7,100	6,200	6,000

PLAIN RED GUM

	1 & 2	No. 1 Com.	No. 2 Com.
1 in.	30,300	13,000	15,500
1¼ in.	.....	.....	.....
1½ in.	8,000	10,300	9,500
2 in.	4,500	3,800	7,500

FIGURED RED GUM

	1 & 2
1 in.	7,800

QUARTERED RED GUM

	1 & 2	No. 1C
4/4	9,000	20,000
5/4	8,100	3,800
6/4	3,900	4,500
8/4	19,100	11,500

SAP GUM

	1 & 2	No. 1 Com.	No. 2 Com.
1 in.	3,400	6,000	200
1¼ in.	.....	800	.....
1½ in.	2,400	6,000	13,500
2 in.	.....	7,700	10,400
2½ in.	.....	1,500	1,200

QUARTERED SAP GUM

	1 & 2	No. 1C
4/4	.....	2,500
5/4	14,000	.....
8/4	2,000	400
10/4	350	29,000

HICKORY

	1 & 2	No. 1 Com.	No. 2 Com.
1 in.	3,200	2,400	11,600
1¼ in.	.....	2,500	2,050
1½ in.	3,600	11,300	25,000
2 in.	2,400	17,200	16,200
2½ in.	7,000	13,000	4,700
3 in.	3,500	7,580	7,200
4 in.	300	.....	275

Also Large Stock of BEECH, BIRCH and MAPLE

THE ATLANTIC LUMBER CO., 310 Manning Chambers, Toronto

MANUFACTURERS SOUTHERN HARDWOOD LUMBER

Yards: BUFFALO, N.Y. Mills: KNOXVILLE, TENN.; FONDE, KENTUCKY

30 Million Feet Hardwoods Yearly

Manufactured by

Darnell-Love Lumber Co.

Leland, Mississippi

We own and operate two large band mills with sufficient timber to supply these mills, at present capacity, fifteen to twenty years

Cutting

Oak, Ash, Gum, Elm

Cypress, Cottonwood

and various other Native Woods

Our Specialties are—

3/8", 1/2", 5/8" and 3/4" in Gum and Oak

and

8/4" Quartered Red Gum

8/4" Quartered Red Gum Sap No Defect

WE SOLICIT YOUR INQUIRIES AND ORDERS

E. SONDHEIMER CO.

MEMPHIS, TENN., U.S.A.

Band Mills at
Baton Rouge, La., Sondheimer, La., Tallulah, La.
Office & Distributing Yard, Memphis, Tenn.

Manufacturers of Southern Hardwoods **Dry Stock Ready for Shipment**

Ask us for prices. We may be able to save you some money. We specialize in genuine Tensas Basin Red Gum—best in the world.

WHITE ASH
10 cars 1" to 4" 1s&2s
10 " 1" No. 1 Com.
5 " 1¼" No. 1 Com.
1 " 1½" No. 1 Com.
3 " 2" No. 1 Com.
5 " 1, 1¼, 1½" No. 2 Cm.

COTTONWOOD
10 " 1" 1s and 2s
15 " 1" No. 1 Com.
10 " 1" No. 2 Com.
5 " 1¼" 1s and 2s
10 " 1¼" No. 1 Com.
10 " 1¼" No. 2 Com.
15 " 1½" No. 2 Cm. & Br.

CYPRESS
1 " 1" Pecky.
10 " 1x4 & 1x7 No. 1 & No. 2 Com.
1 " 1x12" Pecky.
7 " 1½" Sel. & Shop
2 " 2" Sel. & Shop.
2 " 2" Pecky.
1 " 2x6 No. 1 Com.
1 " 3" Shop.

QUARTERED TUPELO
2 " 1" 1s and 2s
10 " 1" 1s and 2s
15 " 1" No. 1 Com.
10 " 1" No. 2 Com.

WILLOW
1 " 1x3 to 17" Box Bds.
10 " 1" 1s and 2s.
15 " 1" No. 1 Com.
15 " 1" No. 2 Com.
10 " 1¼" No. 2 Cm. & Br.
15 " 1½" No. 2 Cm. & Br.
5 " 2" No. 2 Com. & Btr.

MAGNOLIA
5 " 1" No. 2 Com. & Btr.

BLACK GUM
1 " 1" No. 2 Com. & Btr.

PECAN
5 " 6/4" Log Run
5 " 8/4" Log Run

SOFT ELM
2 " 3/4" Crating
3 " 6/4" No. 2 Cm. & Br.
3 " 8/4" No. 2 Cm. & Br.
3 " 10/4" No. 2 Cm. & Br.

QTD. FIG. RED GUM
1 " 1" 1s and 2s
1 " 1" No. 1 Com.

QRTD. RED GUM
2 " 1" 1s and 2s
3 " 1" No. 1 Com.
2 " 1¼, 1½, 2" No. 1 C&B
2 " 2½" No. 1 Cm. & Br.
2 " 3" No. 1 Cm. & Br.

PLAIN RED GUM
4 " 5/8" No. 1 Cm. & Br.
2 " 3/4" 1s and 2s.
10 " 4/4" 1s and 2s
5 " 4/4" No. 1 Com.
1 " 4/4" No. 2 Com.
3 " 1¼ & 2" No. 1 C&B

QRTD. SAP GUM
10 " 1" 1s and 2s.
3 " 1" No. 1 Com.
3 " 1½" 1s and 2s
¼ " 2" No. 1 Com.
½ " 2½" No. 1 Com.
3 " 3" No. 1 C&Btr.

PLAIN SAP GUM
5 " 1x13 to 17" Bx Bds.
8 " 5/8" 1s and 2s
10 " 4/4" 1s and 2s
10 " 4/4" No. 1 Com.
10 " 5/4" No. 1 Cm. & Br.
5 " 5/4" No. 2 Com.

QRTD. RED OAK
5 " 1" 1s and 2s.
3 " 1" No. 1 & 2 Com.
3 " 1¼" 1s and 2s
2 " 1¼" No. 1 Com.

QRTD. WHITE OAK
2 " 1" 1s and 2s
3 " 1" No. 1 Com.
2 " 5/8" 1s and 2s.
2 " 5/8" No. 1 Com.

PLAIN RED OAK
3 " 1" 1s and 2s
10 " 1" No. 1 Com.
5 " 1" No. 2 Com.
5 " 1" No. 3 Com.
1 " 1¼" 1s & 2s

PLAIN WHITE OAK
2 " 5/8" 1s & 2s.
3 " 5/8" No. 1 Com.
1 " 5/8" No. 2 Com.
2 " 3/4" 1s & 2s
10 " 4/4" 1s & 2s
15 " 4/4" No. 2 & 3 Com.

Lumber
Walnut, Mahogany Plain and Quartered Oak, Ash, Cherry

Veneers
Walnut and Mahogany

WE specialize in AMERICAN BLACK WALNUT and can furnish straight cars from 3/8 to 4 inches in thickness. Also can load mixed cars WALNUT and MAHOGANY LUMBER and VENEERS, PLAIN and QUARTERED RED and WHITE OAK, ASH and CHERRY.

The Kosse, Shoe and Schleyer Co.

Eastern Branch:
BALTIMORE, Md.

Main Office and Band Mill:
CINCINNATI, Ohio

American Walnut Lumber

QUALITY

SERVICE

More evidence of our untiring efforts to procure the very best raw material for our product.

All Grades and Thicknesses

Pickrel Walnut Company

St. Louis, Missouri

Tustin Hardwood Lumber Co.

MEMPHIS TENN.

KILN DRIED AND AIR DRIED SOUTHERN HARDWOODS

We operate five mills and Memphis yard, specializing in KILN DRIED Sap Gum, Elm, Maple, Ash. *Send us your inquiries.*

Will quote low prices on following to points not embargoed

4 cars 4/4 No. 1 C. & B. Qtd. White Oak.
1 " 4/4 Fas Qtd. Red Oak.
1 " 4/4 No. 1 Com. Qtd. Red Oak.
2 " 4/4 Fas Plain Red Oak.
5 cars 4/4 No. 1 Com. Plain Red Oak.
3 " 8/4 No. 1 C. & B. Qtd. Red Gum.
4 " 8/4 No. 1 C. & B. Qtd. Sap Gum.

Johnson Brothers Hardwood Co.

(OUR NAME IS EASY TO REMEMBER)

Bank of Commerce & Trust Building **MEMPHIS TENN., U.S.A.**

Manufacturers and Wholesalers

SOUTHERN HARDWOODS

3,000,000 ft. dry stock on hand and 5,000,000 in process of drying—all thicknesses, ½" to 4", plain and quartered.
White and Red Oak—Red Gum—Sap Gum—Tupelo—Black Gum — Cottonwood—Salix—Willow—Pecan—Sycamore—Elm—Soft Maple—Magnolia.

We offer for quick Sale at bargain prices the following Bone Dry Stock:

1 c/l 4/4" No. 1 & 2 Common Qtd. White Oak
2 c/l 8/4" No. 1 Common Qtd. Red Gum, S.N.D.
2 c/l 10/4 Log Run Sycamore
1 c/l 10/4 Log Run Soft Maple
5 cars 4/4" FAS Cottonwood, Regular Widths
1 c/l 8/4" No. 1 C & B Red Gum
1 c/l 8/4" No. 1 C Sap Gum
1 c/l 6/4" No. 1 C & B Red Gum
2 cars 10/4" Log Run Ash

Wire us at our expense for quotations

Yellow Poplar Lumber Co.

Manufacturers of Band Sawed

Poplar Plain Oak
Quartered Oak
Chestnut Basswood

Capacity 50,000,000 per annum

SPECIALTY: Monogram Brand Oak Flooring

CANADIAN ENQUIRIES SOLICITED

COAL GROVE, OHIO, U. S. A.

We Offer For Prompt Shipment

PLAIN SAP GUM

5,400′	3/4	Log Run
14,000′	5/8	No. 1 Com. & Sel.
5,700′	5/8	No. 2 Com.
501,900′	4/4	No. 1 Com. & Sel.
12,500′	4/4	No. 2 Com.
147,600′	4/4	No. 3 Com.
600′	5/4	No. 1 Com. & Sel.
35,600′	6/4	No. 2 Com.
21,900′	6/4	No. 3 Com.
12,700′	8/4	No. 2 Com.
4,000′	4/4	Panels

QUARTERED GUM SND

16,000′	4/4	1sts & 2nds
25,500′	4/4	Com. & Btr.
55,200′	4/4	No. 1 Com. & Sel.
16,000′	8/4	Com. & Btr.

PLAIN RED GUM

15,500′	4/4	1sts & 2nds
120,000′	4/4	No. 1 Com. & Sel.
201,800′	4/4	No. 2 Com.
400′	5/4	1sts & 2nds
1,500′	5/4	No. 1 Com.
9,000′	6/4	1sts & 2nds
1,350′	6/4	Com. & Btr.
3,500′	8/4	No. 1 Com.

QUARTERED RED GUM

85,000′	4/4	No. 1 Com. & Sel.
4,800′	5/4	No. 1 Com. & Sel.
9,000′	6/4	1sts & 2nds
3,200′	6/4	No. 1 Com.
3,400′	4/4	Com. & Btr. Fig.

PLAIN RED OAK

5,230′	5/8	1sts & 2nds
2,593′	5/8	No. 1 Com.
4,100′	3/4	Com. & Btr.
63,300′	4/4	FAS
366,900′	4/4	No. 1 Com. & Sel.
263,800′	4/4	No. 2 Com.
57,200′	4/4	No. 3 Com.
49,300′	4/4	Sound Wormy
3,500′	5/4	Com. & Btr.

QUARTERED RED OAK

26,536′	4/4	1sts & 2nds
18,400′	4/4	Com. & Btr.
50,000′	4/4	No. 1 Com.
800′	4/4	No. 2 Com.

PLAIN WHITE OAK

9,200′	4/4	1sts & 2nds
32,000′	4/4	No. 1 Com.
120,600′	4/4	No. 2 Com.
12,000′	6/4	Com. & Btr.

QUARTERED WHITE OAK

9,100′	4/4	Com. & Btr.
15,000′	4/4	No. 1 Com.

COTTONWOOD

1,800′		Wide Box Boards
3,000′		Nar. Box Boards
12,900′	4/4	No. 2 Com.
4,100′	4/4	No. 3 Com.

ELM

56,700′	4/4	Log Run
4,000′	6/4	Log Run
72,100′	12/4	Log Run

ASH

15,500′	4/4	Log Run
2,000′	8/4	12/4 Log Run

PECAN

3,000′	4/4	Log Run
9,100′	8/4	Log Run

MISCELLANEOUS

3,000′	4/4	Log Run Beech
7,000′	4/4	Log Run Cypress
1,000′	4/4	Log Run Locust
1,500′	4/4	Log Run Maple
16,400′	4/4	Log Run Sycamore
40,900′	4/4	Log Run Black Gum

Send us your inquiries, as this is only a partial list of the stock we have at our mill

"CLAYTON QUALITY" TENSA DETA SOUTHERN HARDWOODS

UTLEY-HOLLOWAY COMPANY

General Office: 1226 Conway Bldg., CHICAGO, ILL. Band Mill: Clayton, La.

ALGOMA
PANEL COMPANY

We manufacture from the log to the finished panel

Specialize on
DOOR PANELS, FURNITURE AND FIXTURE PANELS

Birch, Plain and Qtd. Oak, Mahogany Walnut and Figured Grain

ALGOMA PANEL CO.
Manufacturers Since 1886
ALGOMA, WIS. - U.S.A.

BOLAND LUMBER CO.
Murray Bldg., Grand Rapids, Mich.

Manufacturers and Wholesalers
Northern and Southern Hardwoods

Northern Woods:	Southern Woods:
Ash, Basswood, Beech,	Cherry, Chestnut,
Birch, Hard Maple,	Cottonwood, Cypress, Gum,
Quartered Maple,	Hickory, Magnolia,
White Maple, Soft Maple,	Oak, Poplar, Sycamore,
Soft Elm, Rock Elm,	Walnut, Willow.

Yards at Grand Rapids, Mich., on Grand Trunk and Michigan Central R. R.

Please send us your enquiries and it will be a pleasure to quote you and describe our stocks.

OAK

Plain and Quartered
Uniform Color—Soft Texture

Poplar, Ash
and other
Hardwoods

We have 35,000,000 feet dry stock—all of our own manufacture, from our own timber grown in Eastern Kentucky

Prompt Shipments

The Mowbray & Robinson Co.
(INCORPORATED)

Manufacturers

Office: CINCINNATI, OHIO

MILLS
Quicksand, Ky.; Viper, Ky.; West Irvine, Ky.

Canadian Representative:
M. E. CUMMINGS, 814 Richmond Ave., Buffalo, N. Y.

West Virginia Oak

Thoroughly Dry, Accurately Sawn, Soft Textured, and Uniform in Color.

Write us when needing choice stocks. All lumber produced from virgin timber of large size and excellent quality.

Twenty Million Feet Hardwood Ready for Immediate Shipment

OAK

Yellow Poplar, Ash, Hickory, Beech, Chestnut, Basswood, Walnut, Maple

THE THOMAS HALL LUMBER COMPANY

Manufacturers

CHARLESTON, - WEST VIRGINIA

M. BROWN, Canadian Repres. **Address: 87 Neville Park Blvd., Balmy Beach, Toronto**

Tallahatchie Lumber Company

MEMPHIS, TENN.

Manufacturers of

Band Sawn Hardwoods

Graded so as to be especially attractive to Furniture Manufacturers.

Careful attention to every detail of service.

SEND US YOUR INQUIRIES

High Grade White Hickory

Why Pay High Freights on Waste Material? Stock sawed free and clear of defects to specified sizes. Waste eliminated at source. Operating numerous Mills throughout the choicest HARDWOOD BELTS in the United States.

"Buttcut" Brand

Hickory, Oak and Ash
DIMENSION STOCK

Ski Billets, Picking Sticks, Hockey Sticks, Coupling Rods, Handle Blanks, Furniture Stock, Dowel Blanks, Rim Strips, Spoke Blanks, Shaft and Pole Stock, Gear Woods,, Vehicles and Motor Woods for Bending Purposes.

Brown Brothers Company
MANUFACTURERS
11 Broadway - New York

Southern Michigan Beech

The lower peninsula variety excells any other locality in the soft, even texture and straight grained quality of this product. Cut from old growth virgin timber, this stock is representative of the highest standard of quality.

5/8 No. 2 Com. & Btr.	170M
4/4 Selected & Better	125M
4/4 No. 1 Common	100M
4/4 No. 2 Common	80M
5/4 No. 1 Com. & Btr.	175M
5/4 Selects & No. 1 Com.	25M
5/4 No. 2 Com. & Btr.	200M
5/4 No. 2 Common	50M
6/4 No. 1 Com. & Btr.	150M
6/4 Selects & No. 1 Com.	30M
6/4 No. 1 & 2 Common	52M
6/4 No. 2 Com. & Btr.	250M
6/4 No. 2 Common	75M
8/4 No. 2 Com. & Btr.	150M

Our complete assortment offers exceptional opportunities for replenishing your stocks. If the items listed do not offer the assortment desired, we will supply any grade or combination of grades.

We can kiln dry.

20 Million Feet of Assorted High Grade
NORTHERN HARDWOODS

THE BIGELOW-COOPER CO.
BAY CITY - - MICHIGAN

Thompson-Katz Lumber Co.

Manufacturers of

WHITE ASH EXCLUSIVELY

In dealing with us the wood worker and furniture manufacturer may rightly expect a better service, better value and a greater selection from which to choose his requirements. We have all grades and all thicknesses to offer—beautiful stock that we know will please you. Drop us a card to-day—we'll do the rest.

MEMPHIS, TENNESSEE

J. H. Bonner & Sons

Memphis, Tenn.

Mills:

Jonquil and Ruffwood, Ark.

Manufacturers

Band Sawn Hardwood Lumber

Write or wire for prices on

Gum, Oak, Elm, Etc.

The London Lumber Co. Ltd.

WHOLESALE LUMBER

We have to offer several cars of good Birch, Elm, and Soft Maple in all thicknesses; Write us for quotations.

487½ Richmond St., London, Ont.

Hardwoods

We can furnish you immediately Factory Stock including all grades and thicknesses of

Walnut, Chestnut

Mahogany, Teak, Oak

Ash, Cypress

ALSO

VENEERS

Oak, Maple, Walnut and other Fancy Woods

The McLennan Lumber Co.

Limited

MONTREAL

Crating Lumber

We specialize in the following Crating lumbers

Spruce, White Pine, Jack Pine, Norway Pine, Balm, Poplar, Birch, Maple, Basswood and Elm.

W. Y. Lloyd

350 Confederation Life Building

TORONTO, CANADA

PHONE MAIN 5532

Chas. Gill Lumber Co.

WAUSAU, WISCONSIN

MANUFACTURERS & WHOLESALERS

SPECIALIZING IN

MAPLE
BIRCH
AND
BASSWOOD

Complete Stock Crating Material

We solicit correspondence relative to all Northern Hardwoods

Chicago Office — 501 Lumber Exchange

Band Sawn West Virginia HARDWOODS

The W. C. Barlett Lumber Co.

Charleston, W. Va.

Manufacturers

ASH to WALNUT

We produce a complete line of Band Sawn Hardwoods, serving the Body and Wheel, Furniture, Piano, Cabinet and Interior Finish Trades.

If Superior Quality, Fine Width and Length, coupled with Real Service is desired, let us have your enquiries.

Hardwood Dowels

Plain, Straight and Spiral Grooved

"Canada Wood" dowels are manufactured from high-grade Maple, Birch, Beech or White Oak, uniform in length and nicely pointed, quality guaranteed.

We also manufacture Bailwoods and Variety Turnings in all styles, sizes and descriptions, in the plain, or Enamelled in Black, Natural Wood or Mahogany finishes. Three-eighth in. Maple, Birch and Quarter Cut White Oak Flooring a Specialty. Broom and Mop Handles of every description.

Canada Wood Specialty Co. Limited

Orillia, Ontario

Sawmills at Zebra and Orillia, Ont.
Cable Address: "Special," Orillia, Can.

D. E. Hewit Lumber Co.

Huntington, W. Va.

MANUFACTURERS

West Virginia Hardwoods

(Not Better than the Best but as Good as the Best)

FAS Plain White and Red Oak
No. 1 Com. Plain White and Red Oak
Implement Oak
Sound Wormy Chestnut
No. 1 Common and Better Chestnut
Hickory Plank
Poplar and Basswood

Burns & Knapp Lumber Co.

Manufacturers of

Southern Hardwoods

Plain White and Red Oak, Dimension Oak, Hickory, Ash, Chestnut, Poplar, Basswood, Walnut, Maple, Beech, Butternut.

CONNEAUTVILLE, ——————— PA.

We list below, items of our own manufacture, band sawn, that we are in a position to ship promptly.

1/2", 5/8, 3/4, 4/4, 5/4, 6/4 & 8/4 Quartered White Oak

3/4, 4/4, 5/4 & 6/4 Qtd. Red Oak

5/8, 3/4, 4/4, 5/4, 6/4 & 8/4 Plain Oak

4/4, 5/4, 6/4, & 8/4 Sound Wormy Oak

5/8, 4/4, 5/4 & 6/4 Plain Sap Gum

4, 5, 6, 8, 10 & 12/4 Qtd. Sap Gum

4, 5 & 6/4 Plain Red Gum.

4, 5, 6, 8, 10 & 12/4 Qtd. Red Gum

4, 5, 6 & 8/4 Tupelo Gum.

5/8, 4, 5, 10 & 12/4 Ash.

5/8, 4, 5, 6, 8, 10 & 12/4 Elm.

5/8, 10 & 12/4 Maple.

4, 5 & 6/4 Cottonwood.

MAY BROTHERS Office and Band Mills: MEMPHIS, TENNESSEE

St. Francis Basin Hardwoods
Tennessee Aromatic Red Cedar

SAP GUM

15,000′	4/4″	FAS
100,000′	4/4″	No. 1 Common & Selects.
100,000′	4/4″	No. 2 Common
100,000′	4/4″	No. 3 Common
100,000′	5/4″	FAS
100,000′	5/4″	No. 1 Common & Selects
100,000′	5/4″	No. 2 Common
50,000′	5/4″	No. 3 Common
25,000′	6/4″	FAS
25,000′	6/4″	No. 1 Common & Selects
100,000′	6/4″	No. 2 Common
100,000′	6/4″	No. 3 Common

QUARTERED RED GUM
(Sap no defect)

30,000′	4/4″	No. 1 Common & Better
75,000′	5/4″	No. 1 Common & Better
75,000′	6/4″	No. 1 Common & Better

PLAIN RED GUM

50,000′	4/4″	FAS
100,000′	4/4″	No. 1 Common & Selects
100,000′	4/4″	No. 2 Common
100,000′	5/4″	No. 1 Common & Selects
100,000′	5/4″	No. 2 Common
50,000′	6/4″	No. 1 Common & Selects
50,000′	6/4″	No. 2 Common

QUARTERED RED GUM

50,000′	4/4″	No. 1 Common & Selects
25,000′	5/4″	FAS
50,000′	5/4″	No. 1 Common & Selects
100,000′	6/4″	No. 1 Common & Selects
30,000′	8/4″	No. 1 Common & Better

BLACK GUM

13,000′	4/4″	Log Run, Plain
50,000′	4/4″	Log Run, Quartered

50,000′	4/4	1s&2s Plain White Oak
50,000′	4/4	No. 1 Common & Selects Plain White Oak
30,000′	4/4	Common & Better Plain Red Oak
50,000′	4/4	No. 1 Common & Selects Red Oak

GEO. C. BROWN & COMPANY

General Office, - MEMPHIS, TENN.

BAND MILLS, PROCTOR, ARK. **LAKE VILLAGE, ARK.**

For Discriminating Buyers

Dry stock ready for prompt shipment

FIGURED RED GUM

3	cars	4/4″	No. 1 Com. & Btr.

SAP GUM

2	"	4/4″	FAS
2	"	4/4″	FAS, 13″ & up
3	"	4/4″	Box Boards, 13-17″
1	"	5/4″	FAS
1	"	8/4″	Com. & Btr.
3	"	4/4″	No. 1 Common
4	"	5/4″	No. 1 Common
8	"	4/4″	No. 2 Common
10	"	5/4″	No. 2 Common
1	"	6/4″	No. 2 Common
1	"	8/4″	No. 2 Common

PLAIN RED GUM

1	"	4/4″	FAS
3	"	5/4″	FAS
6	"	4/4″	No. 1 Com. & Btr.
3	"	4/4″	No. 1 Common
5	"	5/4″	No. 1 Common
1	"	8/4″	No. 1 Common
3	"	4/4″	No. 2 Common

QUARTERED RED GUM

3	"	4/4″	Com. & Btr.
2	"	5/4″	FAS
5	"	4/4″	Com. & Btr.
4	"	6/4″	Com & Btr.
3	"	8/4″	Com. & Btr.
3	"	5/4″	No. 1 Common

SOFT ELM

1	"	4/4″	Log Run
1	"	5/4″	Log Run
2	"	6/4″	Log Run
1	"	8/4″	Log Run
2	"	10/4″	Log Run
2	"	12/4″	Log Run

QUARTERED RED GUM S.N.D.

1	"	5/4″	FAS
1	"	3/4″	Com. & Btr.
3	"	4/4″	Com. & Btr.
10	"	6/4″	Com. & Btr.
7	"	8/4″	Com. & Btr.
2	"	5/4″	No. 1 Common

WILLOW

5	"	4/4″	Log Run

CYPRESS

1	"	4/4″	No. 1 Shop
2	"	4/4″	No. 1 Common
1	"	5/4″	FAS
1	"	5/4″	Select
1	"	5/4″	No. 1 Shop
1	"	8/4″	FAS
1	"	8/4″	Select
1	"	8/4″	No. 1 Shop
1	"	8/4″	No. 1 Common

PLAIN RED OAK

1	"	4/4″	FAS
6	"	4/4″	No. 1 Common
7	"	4/4″	No. 2 & No. 3 Common

QUARTERED RED OAK

1	"	4/4″	FAS
7	"	4/4″	No. 1 Common
6	"	4/4″	No. 2 Common

PLAIN WHITE OAK

1	"	4/4″	FAS
4	"	4/4″	No. 1 Common
2	"	4/4″	No. 2 Common

QUARTERED WHITE OAK

1	"	4/4″	FAS
5	"	4/4″	No. 1 Common
7	"	4/4″	No. 2 Common

WIRE FOR QUOTATIONS AT OUR EXPENSE

The

Frank A. Conkling Company

SOUTHERN HARDWOODS

BAND MILLS:
PERCY, Miss., ISSAQUENA, Miss.

Memphis, Tenn.

The Arrow Lumber Co.

Manufacturers and Wholesalers of
West Virginia
Hardwoods and White Pine

Oak Timbers Our Specialty

PARKERSBURG, W. VA.
Mills: Raleigh, W. Va. Natural Well, Va.

McLEAN MAHOGANY & CEDAR CO., INC.

American Hardwoods

WE SOLICIT YOUR ENQUIRIES

742 Ellicott Square, Buffalo, N.Y.

Upham & Walsh Inc.

Throop St. South of 22nd St.
Chicago

Northern and Southern Hardwoods

We make a Specialty of

Oak, Gum, Elm, Maple Birch and Basswood.

We solicit your inquiries regarding lumber of any kind

J. W. Darling Lumber Co.

CINCINNATI, Ohio

Manufacturers and Wholesalers

Southern Hardwoods Cypress, Yellow Pine West Coast Woods

In addition to our operation at
BATON ROUGE, La.
we handle the sales of

J. H. LEAVENWORTH & SON, Greenville, Miss.
FISHER BROS. LUMBER CO. - Cruger, Miss.
KURZ BROTHERS- - - Helena, Ark.

The Bacon Lumber Co.

HARDWOODS:

OHIO and INDIANA
KENTUCKY and WEST VIRGINIA
NORTHERN BIRCH and MAPLE
SOUTHERN GUM, COTTONWOOD

306 Ulmer Bldg., Cleveland, Ohio

IMPORTERS EXPORTERS

MANUFACTURERS

Reed and Rattan Products

Overseas Reed and Cane Co.

Ionia, Michigan

"Headquarters for Quarter-Sawn White Oak"

OAK - POPLAR - GUM

The carefulness with which each order is filled has done much to establish the good-will that exists between our customers and ourselves. May we add your name to our list?

Memphis Band Mill Company

QUALITY Memphis - Tennessee SERVICE

DRY AND PARTLY DRY STOCK

READY FOR SHIPMENT

Your inquiries will bring very prompt quotations. You can depend on straight grades, quick service, and well manufactured lumber.

RED GUM

11219′	8/4	FAS Qtd.
36728′	8/4	No. 1 Com. & Sel. Qtd.
700′	6/4	No. 1 Com. & Sel. Qtd.
4500′	5/4	1st & 2ds Qtd.
19260′	5/4	No. 1 Com. & Sel. Qtd.
3820′	4/4	No. 1 Com. & Sel. Qtd.
62834′	6/4	1st & 2nds
501944′	6/4	No. 1 Com. & Sel.
90395′	6/4	No. 2 Common
2527′	5/4	1st and 2ds Figured
49525′	5/4	1sts & 2nds
350130′	5/4	No. 1 Com. & Sel.
4400′	5/4	No. 1 Com. & Btr. FAS No. 1 Com. & Sel.
29180′	5/4	No. 2 Common
12186′	4/4	1sts & 2nds
103750′	4/4	No. 1 Com. & Sel.
3070′	4/4	No. 1 Com. & Btr. Figured
141775′	4/4	No. 2 Common
37986′	3/4	1sts & 2nds
38280′	3/4	No. 1 Com. & Sel.
26695′	3/4	No. 2 Com. & Sel.

SAP GUM

22000′	8/4	No. 1 Com. & Btr. Qtd. FAS No. 1 Com. & Sel.
6700′	8/4	No. 2 Common Qtd.
3600′	8/4	1sts & 2ds Plain
5680′	8/4	No. 1 Com. & Sel.
14120′	8/4	No. 2 Common
323670′	6/4	1sts & 2ds
677410′	6/4	No. 1 Com. & Sel.
38490′	6/4	No. 2 Common
8500′	6/4	No. 3 Common
168571′	5/4	1sts & 2nds
26745′	5/4	No. 1 Com. & Sel.
190865′	5/4	No. 2 Common
52400′	5/4	No. 3 Common
12502′		1x18" & up Panel & No. 1
11472′		1x11" & wider 1sts & 2ds
12790′		1x13-17" Box Boards
53645′	4/4	9-12" Box Boards
25490′	4/4	1sts & 2ds
294394′	4/4	No. 1 Com. & Sel.
84312′	4/4	No. 2 Common
69590′	4/4	No. 3 Common
48163′	3/4	1sts & 2ds
38530′	3/4	No. 1 Common
8669′	3/4	No. 2 Common
14142′		6 to 8/4 Dog Boards

ELM

87367′	10/4	Log Run No. 2 Com. Btr.
59221′	8/4	No. 2 Com. & Btr.
27882′	5/4	Log Run
15360′		1" to 3" No. 2 Com. & Btr.

PECAN—DRY

4500′	8/4	Log Run
4500′	8/4	Flitches
12000′	6/4	No. 2 Com. & Btr.

OAK

6700′	4/4	1sts & 2ds Qtd. Red
30413′	4/4	No. 1 Com. & Sel. Qtd. Red
6814′	4/4	No. 2 Com. Qtd. Red
25-9′	4/4	No. 3 Com. Qtd. Red
4196′	4/4	No. 2 Com. Qtd. White
9986′	4/4	No. 3 Com. Qtd. White
3450′	10/4	No. 1 Com. & Btr. Red FAS No. 1 Com. & Sel.
4500′	10/4	Common Red
8190′	4/4	1sts & 2ds Plain Red
191673′	4/4	No. 1 Com. & Sel Red
97500′	4/4	No. 2 Common Red
73179′	4/4	No. 1 Com. & Sel. White
22099′	4/4	1sts & 2ds Mixed
156530′	4/4	No. 2 Common Mixed
80237′	4/4	No. 3 Common Mixed
125921′	4/4	Sound Wormy

LA. CYPRESS

8200′	10/4	Shop & Btr. FAS Sel. Shop
3100′	8/4	1sts & 2ds
94601	8/4	Selects
3960′	8/4	Shop
2350′	8/4	Shop & Better
5830′	8/4	No. 1 Common
1800′	6/4	1sts & 2ds
18515′	6/4	Select
3420′	6/4	Shop
7500′	6/4	Pecky
3000′	5/4	No. 1 Common
8000′	5/4	No. 2 Common
3500′	5/4	No. 2 Pecky
3500′	4/4	No. 1 Shop
4872′	4/4	No. 1 Common
12496′	4/4	No. 2 Common
98710′	4/4	Pecky
13425′	4/4	No. 2 Boxing

LA. WHITE ASH

33990′	10/4	No. 1 Com. & Btr. FAS No. 1 Com. & Sel.
22200′	8/4	No. 2 Common
5100′	6/4	1sts & 2ds
16011′	6/4	No. 1 Com. & Sel.
14835′	6/4	No. 2 Common
16646′	6/4	No. 1 Com. & Btr.
28370′	5/4	No. 1 Com. & Sel.
4800′	4/4	No. 1 Com. & Btr. FAS No. 1 Com. & Sel.
10050′	4/4	No. 2 Common
43546′	4/4	No. 3 Common

ARKANSAS YELLOW PINE

196292′	4/4	No. 1, 2 & 3 Com. 6-8-10-12" Widths

COTTONWOOD

19970′		Log Run 30% No. 1 Com. & Sel. 20% No. 2 Com.

ABERDEEN LUMBER COMPANY, Pittsburgh, Pa.

WHEELER - TIMLIN LUMBER CO.

WAUSAU, Wisconsin.

You cannot beat the Birch for an all round wood for the furniture manufacturer. We have BEAUTIFUL BIRCH in all standard thicknesses from 4/4″ to 10/4″ and all grades. Write us for delivered prices.

Mills at DORCHESTER, Wis., and WITTENBERG, Wis.

POPLAR

We offer for prompt shipment from Louisville, Ky., where cars are more plentiful and embargoes less stringent than at other points, the following:

5,000	5/8	Is and 2s
80,000	5/8	No. 1 Common
50,000	5/8	No. 2 Common
40,000	4/4	Saps and Selects
150,000	4/4	No. 1 Common
30,000	4/4	No. 2A Common
40,000	5/4	No. 1 Common
17,000	8/4	No. 2 Common A & B
250,000	4/4	Mill Run
16,000	5/4	Mill Run

This Poplar is Kentucky and Tennessee mountain stock. It's soft textured, shows good widths and lengths and is nicely graded.

WE CAN SURFACE OR RESAW

North Vernon Lumber Mills

NORTH VERNON, IND.

LOUISVILLE, KY. DYERSBURG, TENN.

WRITE FOR COMPLETE LIST AND PRICES

The Hyde Lumber Co.

and Mills: LAKE PROVIDENCE LA.

Southern Office: MEMPHIS, TENN.

Bank of Commerce Bldg.

Northern Office: SOUTH END, IND.

MANUFACTURERS

Plain Red Gum

Quartered Red Gum

Plain Sap Gum

Quartered Sap Gum

Cottonwood, Cypress

Tupelo, Ash, Elm, Oak

CHARLES O. MAUS

Canadian Representative

American Hardwood Lumber Co.

St. Louis, Mo.

Large stock of—

Dry Ash, Quartered Oak

Plain Oak and Gum

Shipments from — NASHVILLE, Tenn., NEW ORLEANS, La., and BENTON, Ark.

WARREN ROSS LUMBER CO.

JAMESTOWN, N. Y.

30,000′	4/4″	1s&2s Tanguile Mahogany	12,000′	8/4″	No. 1 Com. Walnut
35,000′	6/4″	to 16/4 1s&2s Tanguile Mahogany	7,000′	8/4″	No. 2 Com. Walnut
20,000′	4/4″	1s&2s Cherry	15,000′	4/4″	1s&2s pl Red Oak
12,000′	4/4″	No. 1 Com. Cherry	4,000′	5/4″	1s&2s Pl. Red Oak
5,000′	6/4″	1s&2s Cherry	4,000′	6/4″	1s&2s Pl. Red Oak
5,000′	8/4″	1s&2s Cherry	20,000′	8/4″	1s&2s Pl. Red Oak
5,000′	5/4″	No. 1 Com. Cherry	20,000′	4/4″	No. 1 C P Red Oak
2,000′	8/4″	No. 1 Com. Cherry	4,000′	5/4″	No. 1 C P Red Oak
110,000′	1″ to 2″	No. 2 Com. & Btr. Beech	4,000′	6/4″	No. 1 C P Red Oak
1,500′	5/4″	Selects Walnut	10,000′	8/4″	No. 1 C P Red Oak
15,000′	8/4″	1s&2s Walnut	15,000′	4″4″	1s&2s Poplar SND
			3,000′	5/4″	1s&2s Poplar SND
			3,000′	8/4″	1s&2s Poplar SND

Above stock in our Jamestown yard where we have a large stock of all kinds of dry Hardwoods. Also Northern and Southern Hardwoods and Mahogany direct from mill in unlimited quantities.

MAHOGANY LUMBER *and* VENEER
AMERICAN WALNUT VENEER

Loading Mahogany Logs in the Tropics

OUR LARGE AND SELECTED STOCK AT YOUR INSTANT DISPOSAL WHEN NEEDED

Lewis Thompson & Co., Inc. - Colonial Trust Building, Philadelphia, Penn.

Warerooms: Astoria L.I., High Point, N.C. Yards: Astoria, L.I., New Orleans, La.

Established 1843

E. R. Spotswood & Son

INCORPORATED

MANUFACTURERS OF

Kentucky Hardwood Lumber

We specialize in soft texture Kentucky Oak—Plain and Quarter Sawed, also in Ash, Basswood, Chestnut, Poplar, Beech.

Let us quote you on your requirements—our prices are right and we can make prompt shipments direct from our mills.

LEXINGTON - - KENTUCKY

American Black Walnut

Enjoys World Wide Appreciation

In spite of most unfavorable rates of exchange, excessive ocean freight tariffs, and limited financial resources Europe wants America Walnut and is now buying. Europeans know walnut is the finest cabinet wood grown, and rightly refuse to consider substitutes.

Virtues of Walnut should be fully recognized on this continent as every phase of the cabinet wood situation today points out the advantage of featuring American Walnut.

All American Walnut is good but Iowa really affords the best.

We are prepared to supply you with
Walnut Lumber and Veneer

Des Moines Sawmill Company

Des Moines, Iowa

"Hartzell's Choice Walnut"

The way Walnut comes to us

COMING AND GOING

One constant stream of American Black Walnut from "Stump to Consumer" flowing through a steady, reliable and satisfactory channel.

"Geo. W. Hartzell"

Logs in the rough coming in Veneers and Lumber of the highest quality going out daily year in and year out covering a period of 35 years.

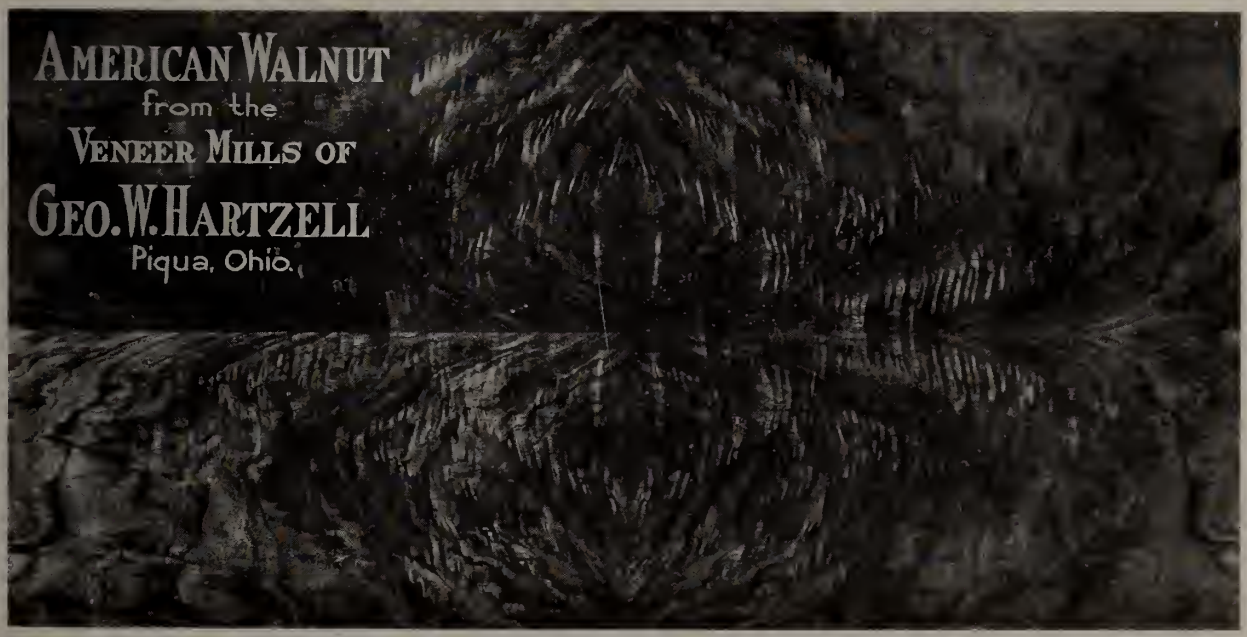
We rightfully claim your patronage because of "SERVICE and QUALITY," if there is any question in your mind about it

"Try Us and We Will Ship You the Convincer"

No Order too large, no Order too small to receive the close and careful attention it is our custom to give. That is a great part of our business, serving our customers.

"WRITE FOR SAMPLES AND QUOTATIONS"

Geo. W. Hartzell - Piqua, Ohio



The way it goes to our Customers

— *A name worth remembering* —

Thomas E. Powe Lumber Co.

St. Louis, Mo.

Manufacturers and Wholesalers of

SOUTHERN HARDWOODS

Specializing in

Ash-Oak-Gum-Poplar

Mills: PRESCOTT, ARK.—DOTHAN, ALA.

ST. LOUIS YARD

Mixed Carload Shipments — Carry stocks of the following:

Hickory	Magnolia	Elm
Maple	Willow	Sycamore
Tupelo	Red Cedar	Beech
Cypress	Plain Oak	Quartered Oak
Sap Gum	Red Gum	Mahogany
Poplar	Ash	Black Gum
Yellow Pine		

WAYNE LUMBER CO.

Manufacturers and Wholesalers

110 West 40th St. New York

Canadian Hardwoods

BROWN ASH

10,000 1¼ No. 1 Com. & Btr.
10,000 1¼ No. 2 Common

BASSWOOD

70,000' 1" No. 2 Common
200,000 1¼ Log Run
1 car 1½ Log Run
1 car 2 Log Run

SOFT ELM

50,000' 1" Log Run
40,000 2 Log Run

BIRCH

10 cars 1" No. 1 Common
5 " 1 No. 2 Common
3 " 1¼ No. 1 Common
7 " 1¼ No. 2 Common
10 " 2 No. 1 Com&1s&2s
7 " 2 No. 2 Common
3 " 2½ No. 1 Com&1s&2s
3 " 2½ No. 2 Common
4 " 3 No. 1 Com&1s&2s

HARD MAPLE

50,000' 1¼" No. 1 Com&1s&2s
10,000 1¼ No. 2 Common

MAPLE AND BIRCH OUR SPECIALTY

BOXING & CRATING

3 cars 1" Basswood, Elm & Ash
10 " 1 Birch

All Lumber Shipped by Our Own Inspectors

A name that should be on your inquiry list for Hardwood Lumber

American Column & Lumber Co.

Brunson Building, COLUMBUS, OHIO

—Manufacturers of—

West Virginia

Soft Yellow Poplar
Plain White Oak
Plain Red Oak
Quartered White Oak
White Oak Timbers and Plank

Chestnut	Butternut
Basswood	Ash
Maple	Cherry
Hickory	Walnut
Beech	Sycamore
Buckeye	Black Gum
Birch	Hemlock

Oak and Hardwood Dimension Stock

Steele & Hibbard Lumber Co.

ST. LOUIS, MO.

52 Years in Business

We carry a large stock of dry

Hardwood Lumber

25 Different Kinds
Quick Shipment
Write or wire for Prices

We specialize Oak cut from Mild Texture Missouri Timber with thin sap both plain and quarter sawed.

We ship also from Sawmills direct; Red as well as Sap Gum and Poplar, both plain and quarter sawed Sound Wormy Chestnut, Cypress and Ash.

F. Huntington Smith

Canadian Representative.

"ENAMELS"

Our business in both White and Old Ivory Enamels and Primers has trebled during the past year.

WHY?

They are the best on the market. If you are not using them, write for samples and prices.

The
Ault & Wiborg Co. of Canada, Ltd.
Varnish Works
Montreal Toronto Winnipeg

British Columbia Forest Products

British Columbia Lumber Commissioner

No. 1 Adelaide St. E., Toronto
(Street Floor)

Personal calls or correspondence cordially invited from Dealers and others interested in British Columbia Woods

Telephone Main 6872. Note: We do not quote prices.

Stock on Hand in Kitchener

7,000	ft.	4/4 SAP Gum No. 1 Com. & Selects
9,000	"	8/4 Qtd. Red. Gum, No. 1 C&B
5,000	"	5/4 Pln. Oak FAS
30,000	"	6/4 Pln. Oak FAS
30,000	"	6/4 Pln. Oak No. 1 Com.
30,000	"	8/4 Pln. Oak FAS
50,000	"	8/4 Pln. Oak No. 1 Com.
12,000	"	8/4 Pln. Oak Sd. Sq. Edge
1,200	"	4/4 Pln. Oak No. 1 Com.
15,000	"	4/4 Tenn. Red Cedar Brds. No. 1 C&B
35,000	"	4/4 Qtd. Wht. Oak FAS
35,000	"	4/4 Qtd. Wht. Oak No. 1 Com.
7,000	"	4/4 No. 2 Com. & Sd. Wormy Chestnut
23,000	"	5/4 No. 2 Com. & Sd. Wormy Chestnut
50,000	"	6/4 No. 2 Com. & Sd. Wormy Chestnut
12,000	"	5/4 FAS Chestnut
10,275	"	5/4 No. 1 Com. Chestnut
		Odd lots of No. 1 Com. Chestnut 4/4, 6/4 & 8/4
1,847	"	3/4 No. 1 C&B Qtd. Wht Oak
69	"	4/4 FAS Qtd. Wht. Oak
2,065	"	4/4 No. 2 Com. Qtd. Wht. Oak
1,000	"	3/4 No. 1 C&B Pln. Wht. Oak
2,624	"	3/4 FAS Sap Gum 13/17"
2,152	"	3/4 Select Sap Gum 3/12
8,573	"	3/4 Select Sap Gum 12" & up
470	"	5/4 Select Sap Gum
15,000	"	12/4 No. 1 C&B Hard Maple
15,000	"	4/4 No. 2 Basswood

PERCY E. HEENEY
202 Weber Chambers, KITCHENER, ONT.

Hardwood Lumber

Wire collect, or write for delivered prices on any or all of the following DRY STOCK

100,000'	4/4 No. 1 Com. & Btr. Sap Gum
92,000'	8/4 No. 2 Com. & Btr. Sap Gum.
69,000'	4/4 No. 1 Com. & Btr. Plain Red Gum.
36,000'	8/4 No. 1 Com. & Btr. Qtd. Red Gum.
12,000'	3/4 No. 2 Com. & Btr. Plain Oak.
119,000'	4/4 No. 1 Com. & Btr. Plain Oak.
60,000'	4/4 No. 2 Com. Plain Oak.
68,000'	5/4 No. 1 Com. & Btr. Plain Oak.
29,000'	5/4 No. 2 Com. Plain Oak.
16,000'	8/4 No. 1 Com. & Btr. Plain Oak.
160,000'	4, 6, 8, 10 and 12/4 No. 2 Com. & Btr. Soft Elm and Soft Maple.
90,000'	4 and 8/4 No. 2 A&B Com. Poplar.
75,000'	8, 10 and 12/4 No. 1 Com. & Btr. Poplar.
75,000'	4/4 No. 2 Com. & Btr. Basswood.
120,000'	4, 8 and 10/4 No. 2 Com. & Btr. Sycamore
150,000'	4, 5, 6 and 8/4 No. 2 Com. & Btr. Beech.
200,000'	4, 5, 6 and 8/4 Sound Wormy Chestnut.

The Woodruff-Powell Lumber Co.
South Bend, Indiana

J. R. EATON & SONS, LIMITED

MANUFACTURERS OF HIGH GRADE WOOD PRODUCTS

Wood Turnings, Hardwood Dowels, Turned Table Legs, Kitchen Tables, Kitchen Cabinets, Oak Extension Tables, Oak Library Tables, "Empire Brand" Hardwood Flooring in Maple, Birch, and Plain or Quarter Cut Oak, Solid Pine and Veneered Hardwood Doors.

A Large Factory equipped with up-to-date machinery is at your service to furnish "WHAT YOU WANT"— WHEN YOU WANT IT."

YOUR ENQUIRIES SOLICITED

Orillia Ontario Canada

Wake-up, Mr. Furniture Man!
Walnut is Plentiful!

AMERICAN WALNUT

"The Cabinet-wood Superlative"

Corners That Stay Square

Chests and cabinets, tables and chairs—how satisfying it is to have their corners stay tight and square, their drawers continue to slide smoothly, their legs remain true and firm through the years.

The corners and drawers and legs of WALNUT furniture have been doing these satisfying things for centuries.

Our museums show multitudes of beautiful examples which have really improved with age. (The Walnut Brochure de luxe shows engravings of many of these. *May we send it?*)

The cabinet maker worthy of the name cannot help but love AMERICAN WALNUT, that superlative cabinet-wood which has almost been the parent of his art and craftsmanship.

So it is your good fortune that there is made every day in America *FURNITURE* of AMERICAN WALNUT which will carry the lesson of your discriminating taste "even unto the third and fourth generation."

You are not forgetting that you want the pleasing Walnut Brochure? Are you? Just drop a line. (*Now* is the best.)

AMERICAN WALNUT
MANUFACTURERS' ASSOCIATION

Room 1019, 616 S. Michigan Blvd., Chicago

ALL BRANCHES OF THE FURNITURE TRADE

are feeling strongly the Effects of the series of tributes to our American Walnut which are running continuously in most of the Best Publications in America. Above is an example.

There are still a few Furniture Houses in the Country

who are giving some of their better-posted competitors a great advantage over them with the Best Trade. WHY? Simply because they "heard somebody say" that American Walnut was getting scarce. Let them ask us for THE FACTS! (See address above.)

Frank Purcell
Walnut Lumber Co.

Plenty of logs like the portion of our stock shown above have made possible the million and a half foot stock of well manufactured American Walnut Lumber which we now have to offer.

Prompt shipment
All grades and thicknesses
Guaranteed Inspection

12th AND BELT LINE

Kansas City - Kansas

SPECIALS!

For Immediate Shipment

QUARTERED RED GUM

8 cars 2½" Common and Better.
5 " 3" Common and Better.
8 " 1¼" Common
8 " 2" Common.

PLAIN SAWED RED GUM

6 cars 2½" Common & Better.
3 " 3" Common and Better.
5 " 2" Common and Better.

OAK

10 cars 1" No. 1 Com. and Btr., White, Pln.
10 " 1" No. 1 Com. and Btr., Red, Qtd.
2 " 1½" 1sts & 2ds Qtd. White.

Thomas & Proetz Lumber Company

No. 3400 Hall St. St. Louis, Mo.

Peytona Lumber Co. Inc.

HUNTINGTON, W. VA.

BAND MILLS OMAR, CHRISTIAN LOGAN COUNTY, W. VA.

Band Sawed West Virginia Hardwoods

WHITE OAK
RED OAK
CHESTNUT
POPLAR
BASSWOOD
MAPLE
BEECH
HICKORY

Our own facilities for Surfacing, Resawing and Kiln Drying

William S. Whiting Company

JOHNSON CITY, TENNESSEE

1 Band Mill *5 Circular Mills*

Hardwood Lumber

Oak Basswood
Maple Buckeye
Chestnut Poplar
Ash Birch

Rotary-Cut Soft Yellow Poplar Veneers
Quarter-Sawn White Oak Flitches
Sliced and Sawn Quartered White Oak Veneers
Oak and Maple Flooring
Dowel Pins and Dowel Rods
Glued-Up Chestnut Cores and Dimension

5-16" Oak Parquetry Flooring Strips and Squares carried in stock at our warehouses:

138 44th St., Brooklyn, N.Y., and at Elizabethton, Tenn.

NAILS AND WIRE

For Every Need in the Woodworking Industry

Bale ties, Nails and Wire of every description are manufactured by us. We manufacture to your order.

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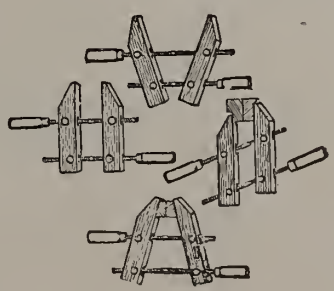
Harry F. Moulden & Sons, Winnipeg, Man.
Mr. Norman Jessiman, 505 Hastings St. W., Vancouver, B.C.
Head Office and Works: HAMILTON, CANADA

Adjustable Clamp Company

216 N. Jefferson St., Chicago, U.S.A.



Manufacturers of the

"JORGENSEN"

the Original Adjustable Steel Spindle Clamp

Adjustable to any position. Well made to give the service. Efficient in every way they are bound to win your approval.

If you cannot buy them from your Jobber write us direct.

Anderson, Shreiner & Mawson

WHOLESALE LUMBER PHONE MAIN 1604 43 VICTORIA ST., TORONTO

All Kinds of Canadian Hardwood and Softwood Lumber

SPECIALS

3 CARS 12/4 NO. 1 COMMON AND BETTER MAPLE
2 CARS 16/4 NO. 1 COMMON AND BETTER MAPLE
500,000 FEET 4/4 TO 16/4 BIRCH

Write or "Phone" for Prices. DRY Mills at South River, Ont.

F. T .DOOLEY, President. T. E. JONES, Secy.-Treas

F. T. Dooley Lumber Co.
Inc.

MANUFACTURERS and WHOLESALERS of

SOUTHERN HARDWOODS

Plain and Quartered Oak
Cypress, Gum, Ash
Soft Maple and Elm

Send us your inquiries

Memphis ∴ ∴ Tennessee

Chas. F. Luehrmann Hardwood Lumber Co.

Manufacturers and Wholesalers of

Hardwood and Yellow Pine Lumber

Office and Yard: 148 Carroll St. St. Louis, Mo.

Hardwood and Yellow Pine for Immediate Shipment from Stock

Complete Stock of Built Up Panels
3 and 5 Ply—Carried in Stock at St. Louis

FIR DRAWER BOTTOMS
FIR DOOR PANELS

Write us for our Stock and Price List

Aromatic Tennessee Red Cedar

CAR LOAD LOTS OR LESS

Earthman Lumber Co.
Murfreesboro, Tenn.

Quality plus Service

AT RIGHT PRICES

Let us quote you on concave chair seat, turned office, piano, restaurant and bath-room stool tops.

Solid table tops, cabinet work; iu fact woodwork of all description.

Algoma Wood Products Co.
ALGOMA, WIS.

The following band sawn stock is ready for prompt shipment. We will be pleased to quote on your requirements at all times. Use the wire at our expense.

QUARTERED WHITE OAK

30M	4/4	FAS
65M	5/4	FAS
25M	6/4	FAS
200M	4/4	No. 1 Com.
140M	5/4	No. 1 Com.
250M	6/4	No. 1 Com.
70M	8/4	No. 1 Com.
14M	4/4	No. 2 Com.
17M	5/4	No. 2 Com.
20M	6/4	No. 2 Com.
2M	5/4	No. 3 Com.
8M	6/4	No. 3 Com.

QTD. WHITE OAK STRIPS

100M	4/4	C&B 1½—4½
11M	5/4	C&B 1½—4½
4M	6/4	C&B 1½—4½

PLAIN WHITE OAK

22M	4/4	FAS
7M	5/4	FAS
18M	6/4	FAS
300M	4/4	No. 1 Com.
25M	5/4	No. 1 Com.
90M	6/4	No. 1 Com.

QUARTERED RED OAK

4M	4/4	FAS
50M	5/4	FAS
10M	6/4	FAS
85M	4/4	No. 1 Com.
100M	5/4	No. 1 Com.
20M	6/4	No. 1 Com.

PLAIN RED OAK

70M	4/4	FAS
30M	5/4	FAS
35M	6/4	FAS
300M	4/4	No. 1 Com.
200M	5/4	No. 1 Com.
125M	6/4	No. 1 Com.
15M	4/4	No. 2 Com.
15M	5/4	No. 2 Com.
15M	6/4	No. 2 Com.
200M	4/4	No. 3 Com.
40M	5/4	No. 3 Com.
50M	6/4	No. 3 Com.

QUARTERED SYCAMORE

20M	4/4	No. 2 C&B

SOUND WORMY OAK

200M	4/4	
80M	5/4	
50M	6/4	

QUARTERED RED GUM

15M	4/4	FAS
2M	5/4	FAS
14M	6/4	FAS
40M	8/4	C&B
30M	4/4	No. 1 Com.
7M	5/4	No. 1 Com.
10M	6/4	No. 1 Com.
150M	8/4	No. 1 Com.

PLAIN RED GUM

30M	4/4	FAS
10M	4/4	C&B
60M	4/4	No. 1 Com.
25M	5/4	No. 1 Com.
9M	6/4	No. 1 Com.
85M	4/4	No. 2 Com.

QUARTERED RED GUM (Sap No Defect)

75M	4/4	C&B
175M	6/4	C&B
300M	8/4	C&B
300M	10/4	C&B
300M	12/4	C&B
75M	4/4	No. 1 Com.
9M	6/4	No. 2 Com.
4M	8/4	No. 2 Com.
8M	10/4	No. 2 Com.
5M	12/4	No. 2 Com.
4M	10/4	No. 3 Com.

PLAIN SAP GUM

25M	4/4	FAS
30M	5/4	FAS
3M	6/4	FAS
200M	4/4	No. 1 Com.
70M	5/4	No. 1 Com.
70M	6/4	No. 1 Com.
165M	4/4	No. 2 Com.
100M	6/4	No. 2 Com.
11M	8/4	No. 2 Com.
25M	4/4	No. 3 Com.
5M	5/4	No. 3 Com.
100M	8/4	No. 3 Com.

ASH

125M	10/4	C&B
40M	12/4	C&B
2M	4/4	No. 1 Com.
80M	5/4	No. 1 Com.
35M	6/4	No. 1 Com.
2M	8/4	No. 1 Com.
15M	5/4	No. 2 Com.
4M	6/4	No. 2 Com.
15M	5/4	No. 3 Com.

COTTONWOOD

18M	4/4	wd bx bds
10M	4/4	FAS
17M	4/4	wide FAS
225M	4/4	No. 1 Com.
30M	4/4	No. 2 & 3 Com.

CYPRESS

15M	4/4	Shop
2M	6/4	No. 1 Com.
18M	6/4	No. 1 Com.

ELM

30M	4/4	No. 2 C&B
100M	8/4	No. 2 C&B
100M	10/4	No. 2 C&B
50M	12/4	No. 2 C&B
15M	16/4	No. 2 C&B
30M	10/4	No. 1 Com.

TUPELO GUM

15M		wd bx bds
300M	4/4	C&B
6M	5/4	C&B
8M	6/4	FAS
2M	6/4	No. 1 Com.
50M	4/4	No. 2 Com.

POPLAR

3M	4/4	Saps & Sel.
15M	4/4	No. 1 Com.
35M	4/4	No. 2 Com.

MAPLE

15M	4/4	No. 2 C&B
35M	10/4	No. 2 C&B

LOCUST

3M	4/4	No. 2 C&B

HACKBERRY

6M	4/4	No. 2 C&B

GAYOSO LUMBER COMPANY

MEMPHIS, TENNESSEE U.S.A.

Canadian Representative:

W. R. YOUMANS, Park View Hotel, Toronto, Ont.

PERIOD CARVINGS

for

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Quality the Best

Prompt Shipment

Largest Manufacturers of Imitation Wood Carvings in the World

Unlimited facilities for the manufacturing of high grade period wood carvings in composition and wood fibre. Reproductions of exclusive designs our specialty.

CATALOGUE SENT ON REQUEST

THE DECORATORS SUPPLY COMPANY

ARCHER, LEO AND LIME STREETS

CHICAGO

Indiana

Quartered Red and White

OAK

1,000,000 feet of dry stock carried at all times

ALSO PLAIN OAK AND ASH

We manufacture all stock carried

Evansville Band Mill Co.

FRANK M. CUTSINGER, Pres.
GEO. H. FOOTE, Vice-Pres. & Treas.
JOSEPH WALTMAN, Secretary

Mills at EVANSVILLE, Indiana

E. M. Nicholson & Co.

Wholesalers of Canadian Hardwoods

201-2-3 Board of Trade Bldg.,

Montreal

Special Items of Interest

for Prompt Shipment

WHITE ASH

11,000′	4/4	No. 2 C&B

BROWN ASH

60,000′	4/4	No. 1 C&B
16,000′	6/4	No. 1 C&B
8,900′	8/4	No. 1 C&B

BASSWOOD

75,000′	4/4	Sel. & Fas.
100,000′	4/4	No. 1 & 2. Com.
75,000′	6/4	No. 1 Com. & FAS
50,000′	6/4	No. 2 Com.
40,000′	8/4	No. 1 C&B

MAPLE

75,000′	4/4	Log Run

BEECH

65,000′	4/4	Log Run

BIRCH

30,000′	4/4	FAS
90,000′	4/4	No. 1 Com.
150,000′	4/4	No. 2 Com.
30,000′	5/4	No. 1 Com. & FAS
45,000′	6/4	FAS
60,000′	6/4	No. 1 Com.
75,000′	6/4	No. 2 Com.
100,000′	8/4	Sel. & Fas.
150,000′	8/4	No. 1 Com.
100,000′	8/4	No. 2 Com.
75,000′	10/4	Sel. & Fas.
125,000′	10/4	No. 1 Com.
250,000′	12/4	Sel. & Fas.
100,000′	16/4	Sel. & Fas.

SOFT ELM

45,000′	4/4	No. 2 C&B
21,000′	6/4	No. 1 C&B
22,000′	8/4	No. 1 C&B

150,000′ 4/4 Basswood, Birch, Ash, Elm No. 3 Com. Under National Rules.

We can make prompt shipment any time of following

GUM

Sap Red Tupelo Black Cypress Cottonwood Oak Ash Elm Beech Sycamore Crating Fir Spruce Yellow Pine

Wire or write us for Prices

Manufacturers & Wholesalers

Cornelius Lumber Co.

Home Office—Arcade Building, St. Louis, Mo.
Northern Office—Lumber Exchange, Chicago, Ill.
Northwestern Office—Merchants Nat. Bank Bldg., St. Paul, Minn.
Southern Office—Memphis, Tenn.
Saw Mills—Drew, Miss., Osmeek,, La., Lake City, Fla.

OAK ASH COTTONWOOD MAPLE

Chapman & Dewey Lumber Company

GUM ELM SYCAMORE CYPRESS

Manufacturers of

Southern Hardwoods

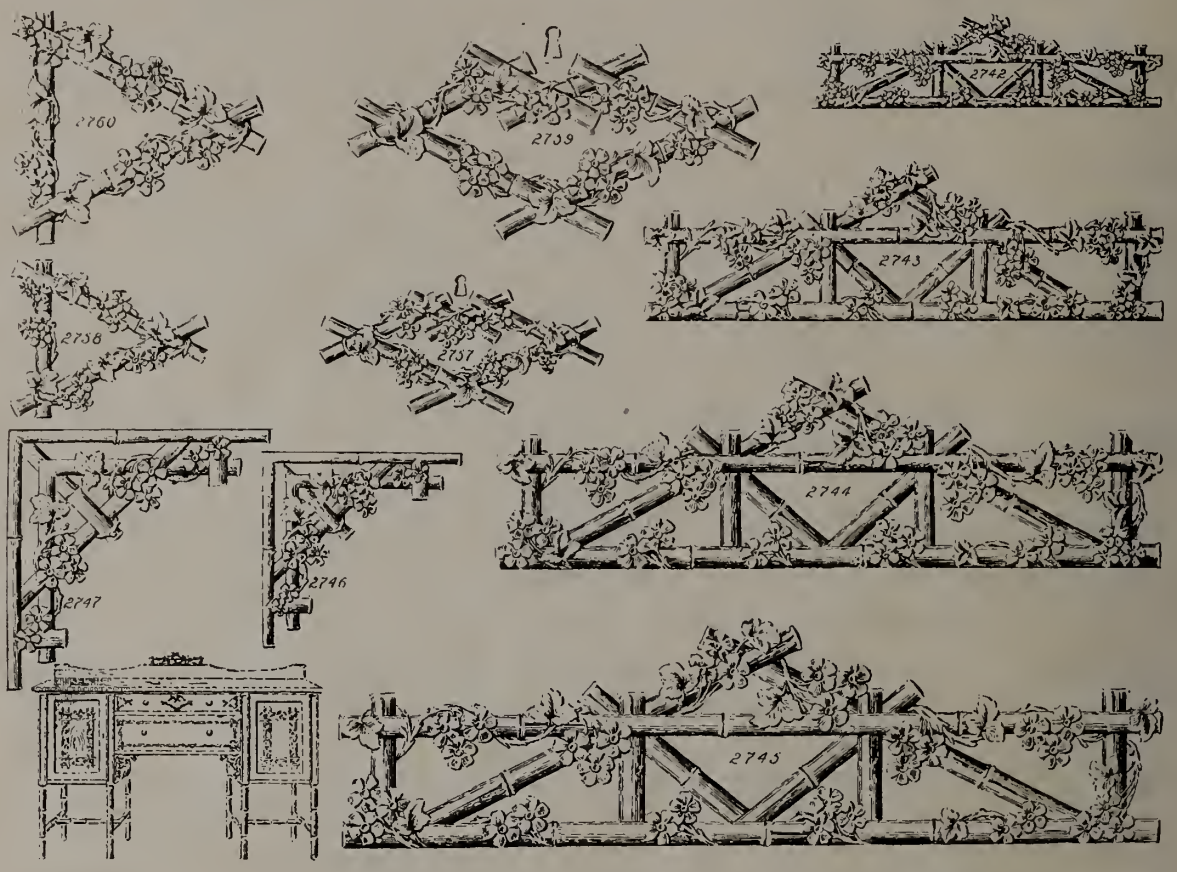
Band Sawn at our Mills in the St. FRANCIS RIVER BASIN

We solicit your enquiries

Offices:

MARKED TREE, Ark. **KANSAS CITY, Mo.**

Wood Fibre Carvings



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Furniture	Churches	Altars	Steamships
Offices	Schools	R. R. Coaches	Show Windows

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6/4" Log Run .. .. .. 50,000'
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10/4" Log Run .. .. .. 35,000'
12/4" Log Run .. .. .. 30,000'
16/4" Log Run .. .. .. 2,000'

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6/4" No. 1 Common & Selects .. .. .. 15,000'

QUARTERED RED GUM (SAP NO DEFECT)
6/4" No. 1 Common & Better .. .. .. 50,000'
8/4" No. 1 Common & Better .. .. .. 50,000'

SAP GUM
5/8" No. 1 Common & Better .. .. .. 7,000'
4/4" Panel & Wide No. 1 .. .. 16,000'
4/4" Box Boards 13-17" 75,000'
4/4" 1sts & 2nds .. ..100,000'
5/4" 1sts & 2nds .. .. 30,000'

PLAIN RED OAK
4/4" 1sts & 2nds .. .. 50,000'
4/4" No. 1 Common & Selects .. .. ..200,000'
4/4" No. 2 Common ..150,000'

PLAIN WHITE OAK
4/4" 1sts & 2nds .. .. 50,000'
4/4" No. 1 Common & Selects .. .. ..150,000'
4/4" No. 2 Common..100,000'
6/4" Log Run .. .. .. 7,000'

QUARTERED WHITE OAK
Thin No. 1 Common & Better .. .. .. 30,000'
4/4" No. 1 Common & Better Strips 2½-5½ .. ..100,000'
4/4" Log Run .. .. ..125,000'
5/4" Log Run .. .. .. 25,000'
6/4" Log Run .. .. .. 10,000'

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High Freight Rates Strangle Industry

Faced with a curtailed demand for their products, the attention of many woodworkers and furniture manufacturers has turned to overseas trade. A market for certain lines of furniture and many articles of wood exists in certain centres in Europe, South America and South Africa, but Canadian manufacturers are prevented from competing successfully with those from other countries, owing to the excessively high cost of land and water transportation.

As an illustration, the case of the North American Bent Chair Co., Limited, of Owen Sound, Ont., might be cited. This firm, who are the largest manufacturers of bent chairs in the British Empire, depend largely on export trade to keep their huge plant in operation. Owing to the exchange situation and the ever-mounting freight charges, they stand to lose many of the overseas connections worked up at a large expenditure of time and money. As they are largely dependant on export trade, the situation is so serious that this large plant may be closed down for an indefinite period.

A few years ago the rates on chairs were 23 cents per hundred pounds to the seaboard and 30 cents for trans-Atlantic freight. This has been increased to 62 cents to the seaboard and $1.50 from there to the other side, a total of $2.12, which represents an increase of 400 per cent. Based on present charges, it costs from 25 to 30 cents per chair to land a shipment in Great Britain. This constitutes an almost insurmountable barrier to the development of Canadian export trade, especially when faced with competition from firms in Sweden, Norway and other nearby countries, where lower wages and cheaper freights prevail.

There is something wrong when the transportation companies, whether under private or public control, are permitted to strangle the industrial development of Canada. This is a condition that works a serious hardship on the country, results in unemployment and reduced production and the railways lose freight, which means decreased earnings, that they would otherwise secure were lower rates in force.

It would appear to be better for the railways and marine lines, including the Canadian Merchant Marine, to handle this business at reduced tariffs than to lose the greater part of it altogether. If the transportation companies will not listen to reason, surely the Board of Railway Commissioners are willing to act, if the matter be brought to their attention. Failing that, the Government might be prevailed to come to the assistance of Canadian industry and aid in the development of overseas trade either by agreeing to pay a certain percentage of the freight on all export business or by subsidizing all Canadian products going overseas. Export trade is needed to rectify the exchange situation, to provide employment and put the country in a prosperous condition. It is in the best interests of all that no efforts be spared to foster and develop outside business.

Shall Wages Be Reduced or Maintained?

It was intimated in the December "Canadian Woodworker & Furniture Manufacturer" that to a certain extent the future of the woodworking industry depends upon conditions in the building and construction trades. As new homes and other buildings are put up and furnished an increased demand is created for furniture and wood products of all kinds. The concensus of opinion seem to be that before building revises to any marked extent, the price of all material entering into the home and its construction must be reduced still further. That may mean that the cost of manufactured building materials, sash, doors, moulding, etc., may be forced down to a still lower level.

This naturally brings up the subject of wages. To what extent should labor assist in bringing costs and prices down so that a demand be created, orders come in freely and work provided for everybody? Shall wages in the woodworking industry be reduced or maintained? Do conditions warrant a reduction in the scale being paid? Would reduced prices on wood products tend to stimulate building and work out to the benefit of all woodworkers? In view of the rates paid in other industries and the difficulties experienced, in the past in securing skilled mechanics, is it advisable to cut wages to any extent? Are lower wages desirable or justifiable?

Whatever is done, the same policy should be followed by all woodworkers. It is a big question, one in which there is plenty of scope for an interesting discussion. The columns of the "Canadian Woodworker" are thrown wide open to all readers. Read the opinions published elsewhere in this issue and send in your views and outline your policy. Let the February "Canadian Woodworker" contain expressions of opinion by leading men in the industry, from coast to coast.

Modern adaptation of Italian Renaissance furniture

Spirit of Italian Renaissance Furniture

Influence Felt Through Succeeding Centuries—Early Craftsmen Understood Design and Proportion—Intentional Relation Between Different Dimensions —Modern Adaptations Command Ready Sale

HISTORY has a way of repeating itself. When the pendulum swings in one direction, it invariably returns and moves to the other side. This is true of business cycles where high production and high prices are usually followed by a period of low productiveness and shrunken values. The same may be said of art and decoration. It has been shown that when popular fancy turns from the tried and beaten pathways of pleasing proportions, graceful lines and attractive ornamentation and clamors for that which is bizzarre and inartistic, sooner or later there comes a revulsion of feeling, a swinging of the pendulum in the other direction and a searching after and a yearning for that which is beautiful and altogether desirable. It is this latter phase, a sense of good taste on the part of the general public, that is spurring on our furniture manufacturers in their efforts to produce attractive, well-designed furniture.

Buffet with Italian Renaissance motif

A swing of the pendulum, which left its imprint on art and decoration for all time to come, known as the Renaissance period, occurred during the later part of the fourteenth and the early part of the fifteenth centuries. While this movement, or "rebirth of art," as it is termed, touched all the countries of Europe, it reached its greatest development in Italy, hence is often spoken of as the "Italian Renaissance period."

All branches of art and decoration were affected, including furniture and furnishings for home. Before that time the furniture was almost a part of the building itself. It was stiff, stately, architectural in appearance, and was practically immovable. Under this regime it took on new lines and new forms, instead of a throne, we find a chair, the huge unweildy boxes were replaced by the more attractive, serviceable chest. This development did not stop there. The furniture became lighter and less unweildy; new forms and styles were introduced and other startling changes took effect.

The craftsmen of the Renaissance period builded upon tried and tested foundations—the experience of the older men, an instinctive grasp of that which constitutes good design and a native instinct for that which is beautiful. Most of the furniture produced was well proportioned, the lines pleasing and the ornamentation well executed and not overdone. They not only understood the principles of good design but adhered strictly to such fundamentals in all their work. This is a point that many present-day designers might take to heart as they seem prone to wander far afield, to experiment often with disastrous results. A study of the trend and development of furniture design tends to prove that when a departure is made from the known principles of design, the results are far from satisfactory.

The best furniture of that period—it was not all good—is distinguished by symmetry, good balance, and perfect proportions. Proportion is to a certain extent governed by mathematical rules, yet is something which is felt and applied instinctively rather than mechanically. There will be found in most of the furniture produced during the Italian Renaissance period an intentional relation between the different dimensions. These dimensions or proportions are

capable of setting up a pleasurable reaction in those of us whose sense of proportion is alive to such influences.

In addition to this sense of proportion, the craftsmen of that day possessed an eye for design. They were able to divide their spaces in a manner calculated to give the effect of grace, dignity or charm and and apply the correct amount and character of ornamentation. This decoration was seldom crude or overdone. The cabinets illustrated herewith show distinct stages of development, each bringing out a distinctive leading characteristic. Thus we are able to catch a spirit of dignity, grace, power and charm worked into pieces of inanimate furniture.

Carving and inlay were the principal forms of decoration used. The inlaying was done largely in ivory and bone. Toward the later part of the 14th century certain forms of mosaic were worked out in the furniture. the materials used being natural and dyed woods and metals. These were at first simple geometrical patterns but soon developed into elaborate pictorial mosaics. As metal work had developed and kept pace with other lines, much of the furniture is ornamented with metal decorations in beautifully wrought steel, iron, brass and bronze.

Cabinet with Italian Renaissance feeling. Suitable for phonograph

Cabinets, chairs, tables, chests and beds were found among the furniture of that period, the cabinets being, probably, the most important. It was usually a thing of dignity. Richly carved and decorated these pieces reflect the skill and ability of those early craftsmen.

High back chairs, in the usual conventional forms, were in abundance. These were more or less stiff but were at the same time stately and attractive, with their flat, square seats and arms. The "curule" or Savonarola chair, which resembles the letter "X," has a distinct appeal owing to grace and beauty of its lines and its pleasing proportions.

Italian Renaissance tables of the best forms have survived to the present day. The best known style is oblong and supported at the ends by solid supports or consoles, beautifully shaped and carved, often terminating in claw or scroll feet. These consoles in turn were usually connected by a heavy stretcher. Smaller supports, in the form of an arcade, sometimes rest on this shelf or stretcher.

The development of architecture and an improvement in furniture design go hand in hand. John Addington Symonds, the great historian of the Renaissance, gives a summary of the advance and development of architecture from which we may gather some idea of the spirit which prompted the advancement of art during the Italian Renaissance period. He says:

"Three periods in the development of Renaissance architecture may be roughly marked. The first, extending from 1420 to 1500, is the age of experiment and of luxuriant inventiveness. The second embraces the first forty years of the sixteenth century. The most perfect buildings of the Italian Renaissance were produced within this short space of time. The third, again comprising about forty years, from 1540 to 1580, leads onward to the reign of mannerism and exaggeration, called the Italian barocco. In itself the third period is distinguished by a scrupulous purism bordering upon pedantry, strict adherence to theoretical rules, and sacrifice of inventive qualities to established canons. To do more than briefly indicate the masterpieces of these three periods would be impossible in a work that does not pretend to treat of architecture exhaustively; and yet to omit all notice of the buildings of this age and of their styles, would be to neglect the most important art-phase of the time we have undertaken to illustrate.

The various forces and influences which determine the divisions of the Renaissance into these periods need to be understood to explain the advances made throughout them and Symonds is once again our helper.

"In the first period we are bewildered by the luxuriance of creative powers and by the rioting of the fancy in all forms of beauty indiscriminately mingled. In general we detect a striving after effects not fully realized, and a tendency to indulge in superfluous ornament without regard for strictness of design. The imperfect comprehension of classical models and the exuberant vivacity of the imagination in the fifteenth century account for the florid work of this time. Something too is left of mediaeval fancy; the details

Power

Dignity

borrowed from the antique undergo fantastic transmutation at the hands of men accustomed to the vehement emotion of the romantic ages. Whatever the Renaissance took from antique art, it was at first unable to assimilate either the moderations of the Greeks or the practical sobriety of the Romans. Christianity

Grace

had deepened and intensified the sources of imaginative life; and just as reminiscences of classic style impaired Italian Gothic, so now a trace of Gothic is perceptible in the would-be classic work of the Revival. The result of these combined influences was a wonderful and many-featured hybrid, best represented in one monument by the facade of the Certosa at Pavia. While characteristic of the work of the earlier Renaissance as fused of divers manners, we must not forget that it was truly living, full of purpose, and according to its own standard sincere. It was a new birth; no mere repetition of something dead and gone, but the product of vivid forces stirred to original creativeness by admiration for the past. It corresponded, moreover, with exquisite exactitude to the halting of the conscience between Christianity and Paganism, and to the blent beauty that the poets loved. On reeds dropped from the hands of dead Pan the artists of this period each in his own sphere, piped ditties of romance.

"In no other style than this of the earlier Renaissance is the builder more inseparably connected with the decorator. The labours of the stone-carver, who provided altars chased with Scripture histories in high relief, pulpits hung against a column of the nave, tombs with canopies and floral garlands, organ galleries enriched with bas reliefs of singing boys, ciboria with kneeling and adoring angels, marble tabernacles for relics, vases for holy water, fonts and fountains, and all the indiscribable wealth of scrolls and friezes around doors and screens and balustrades that fence the choir, are added to those of the bronze-founder, with his mighty doors and pendent lamps, his candelabras sustained by angels, torch-rests and rings, embossed basements for banners of state, and portraits of recumbent senators and prelates. The wood-carver contributes tarsia like that of Fra Giovanni da Verona. The work in wrought iron welds such screens as guard the chapel of the Sacra Cintola at Prato. The Robbias prepare their delicately-toned reliefs for the lunettes above the doorways. Modellers in clay produce the terra-cotta work of the Certosa, or the carola of the angels who surround the little cupola behind the church of St. Eurstorgio at Milan. Meanwhile mosaics are provided for the dome or let into the floor, agates and marbles and lapis lazuli are pieced together for altar fronts and panellings; stalls are carved into fantastic patterns, and heavy roofs are embossed with figures of the saints and armorial emblems. Tapestry is woven from the designs of excellent masters; great painters contribute arabesques of fresco or of stucco mixed with gilding, and glass is colored from the outlines of such draughtsmen as Ghiberti.

"In the second period the faults of the first group of Renaissance builders were in a large measure overcome, and their striving after the production of new yet classic form was more completely realized. The reckless employment of luxuriant decoration yielded to a chastened taste, without the sacrifice of beauty or magnificence. Style was refined; the construction of large buildings was better understood, and the instinct for what lies within the means of a revived and secondary manner was more true.

"Michael Angelo forms the link between the second and third periods of Renaissance. Among the architects of the latter age we have to reckon those who based their practice upon minute study of antique writers, and who, more than any of their predecessors, realized the long sought restitution of the classic style, according to precise scholastic canons. A new age had now begun for Italy. The glory and the grace of

Charm

the Renaissance, its blooming time of beauty, and its springtide of young strength, were over. Strangers held the reins of power, and the Reformation had begun to make itself felt in the Northern provinces of Christendom. A colder and more formal spirit everywhere prevailed. The sources of invention in the art

(Continued on page 76)

Excellent Displays of Canadian Furniture

1921 Furniture Exhibitions in Advance of all Previous Efforts—Attendance Satisfactory but Buying Inclined to be Light—Brief Outline of General Conditions

By R. G. Wells

The most pretentious display of furniture ever made by the furniture manufacturers of Canada, was shown at the exhibitions held in Toronto, Kitchener, Waterloo and Stratford, Jan. 10th-22nd. The pieces on view comprised the choicest products of a large number of factories and represented the best work of the Canadian furniture manufacturing industry.

Some 90 manufacturers of furniture and furnishings outdid themselves in their efforts to better the displays made on former occasions. Not only were the different pieces shown to good advantage, but a touch of home was imparted by the inclusion of floor and table lamps, books, attractive hangings and floor coverings. Nor was the festive and social side of the occasion overlooked, as the exhibitions were marked by banquets and dinners, at which good fellowship reigned, and other forms of social festivities. The displays were divided up as follows: about 50 showing at Toronto, 32 at Kitchener-Waterloo, and 8 at Stratford.

Many Dealers in Attendance

The exhibitions have been open only four days at this writing, so that it is a little too early to give a clear indication of the results accruing. A fairly satisfactory number of retailers have visited the different centres, examined the displays and talked with the manufacturers present, then wandering along to the next centre. As yet the buying has been light, and while the volume of sales made, total up to a considerable figure, the purchases made have been more in the nature of sorting-up orders, than an evidence of a general resumption of buying.

The manufacturers are all more or less optimistic. They realize that the natural tendency is for the dealers to look around, visit the different centres where the exhibitions are being held and compare designs and values, before placing their orders. This is happening. Some of the visitors will double back and place a few orders, while others will return home, and the travellers will reap the benefit when they call.

Optimism Well Founded

There is every reason for optimism. The retail trade enjoyed a good volume of business right up to the close of 1920. At the present moment their stocks are low, so that it is only a question of time before they will be forced to replenish their depleted floors. There is no doubt that they were overstocked last fall, which accounts for the fact that the manufacturers could not secure any business toward the close of the year. The reason the dealers are not buying freely now, is partly psychological and partly due to the fact that they have been looking for marked reductions. Now that they have seen the new lines, learned the prices that will prevail for the next few months, have talked with the manufacturers and have been assured that no further reductions are possible or contemplated, they should return home convinced of the fact that furniture values have reached rock bottom for the present at least.

Well Worth While

Even though the total sales made during the two weeks the exhibitions are open, should be disappointing, the fact that the retailers were afforded an opportunity to see the newer lines, learn, first hand, the prevailing prices and discuss conditions with those in the manufacturing field, should result in the dealers departing with a renewed confidence in the furniture industry, and first-hand information on which to base plans, and the establishment of a closer bond between retailer and manufacturer, and thus repay the manufacturers for the time, energy and money expended.

A meeting of the Retail Furniture Dealers' Association was held in Toronto, Friday Jan. 14th. In this connection the furniture manufacturers entertained the dealers at a banquet in the King Edward Hotel. About 400 guests were present, including retailers, manufacturers and their representatives, and representatives of the trade and daily press. The dinner was followed by an entertainment, interspersed with speeches and toasts. The crowning event of the evening was a fast 6 round bout between the amateur feather and bantam-weight champions of Canada. This number was a complete surprise, as it was not announced on the programme. It was put on in a novel and interesting way.

Thos. Bell, Southampton, Ont., veteran furniture manufacturer, who received ovation at banquet in Toronto. Been manufacturing since 1868.

Splendid Spirit Shown

The keynote of the evening was optimism, co-operation and good fellowship. If the spirit and vision displayed at this banquet is carried out into everyday business transactions, there is no doubt as to what the next few months hold in store for the furniture industry. James Acton, of the Acton Publishing Co., Toronto, occupied the chair, while F. E. Coombe, G. O. Luke, T. E. Simpson, Clarence Coryell, J. R. Shaw, H. P. Sullivan, Wm. Cawkell and James E Ferguson were the speakers of the evening. A most enjoyable and instructive time was spent by all.

In addition, the Retail Furniture Dealers' Associa-

tion are scheduled to meet in Kitchener Jan. 18th and in Stratford, Jan. 21st. This should bring a large number of visitors to these different centres. It is fully anticipated that the closing days of the exhibition will see a large number of retail dealers in attendance and that a considerable amount of business will be transacted.

Prices on nearly all lines show a slight downward tendency. Each article was priced with regard to present conditions and replacement values. While the reduction is general, it varies in each piece, as different articles are effected by reductions in costs of different materials.

"The Lumber Business"

One of the brightest, most interesting volumes that has come to the editorial desk in a long time is a small book entitled "The Lumber Business" from the able pen of W. M. Ritter, of the W. M. Ritter Lumber Co., Columbus, Ohio. He deals with the lumbering business under three headings—organization, production and distribution. If space permitted many forceful and interesting extracts could be quoted. A few shorter suggestions are: "The ability to think accurately is the greatest business faculty a man can have," "Efficiency is doing the right thing, in the right way, at the right time,' all the time," "Managers are judged by the men they make," "With ability to think, to imagine and to remember, a man will succeed unless he deliberately prefers not to do so."

Buying Light at Grand Rapids

The exhibition held at Grand Rapids Jan. 3-22, was disappointing, judging from the amount of business placed, although the volume of scales and the number in attendance compared favorably with the January markets of 1915, 1916 and 1917. The attitude of the salesmen is that they will secure many orders, when on the road, as a result of this display. The many unfounded rumors in circulation tended to retard buying. These rumors could not be confirmed and in the face of such absurd statements, there was a strong determination exhibited on the part of manufacturers, not to sell goods at a loss. A majority of the case goods manufacturers have closed their plants but it is expected that most of them will reopen Feb. 1st. The general feeling was that the financial uncertainty is at an end, the future assured and that there will be a gradual resumption of buying.

Large Quantities of Pencil Cedar

Though incense cedar is not a rare wood, pencil manufacturers and cabinet makers have difficulty in keeping a sufficient quantity of this material in stock. It is estimated that there is a supply measuring eleven billion feet in this country, of which ten billion is located within the boundaries of California. The trouble is that the heartwood of incense cedar is commonly honey-combed by a dry rot which makes a large part of it valueless for timber. On account of this, experienced lumbermen frequently reduce estimates by 30 to 50 per cent. It costs as much to cut and bring to market a diseased tree as a sound one, and lumbermen hestitate to work with a wood which gives such a large average loss.

Dr. John S. Boyce of the Bureau of Plant Industry, United States Department of Agriculture, has finished a very complete study of this dry rot of incense cedar. The results as published in Department Bulletin 871, "The Dry Rot of Incense Cedar," show that a change of methods of marking and bucking—that is, designating what trees are to be cut, estimating the amount of timber that is in the trees, and sawing the timber into log lengths—will ultimately materially alter the status of this tree—that sound trees and logs can be distinguished from decayed.

Eat and be merry tonight for tomorrow we work.
—Old Bill

Menu

FRUIT COCKTAIL AU CRAMPS
QUEEN ANNE OLIVES

WATER STAIN SOUP, TOMATO

DRY KILLED LAKE TROUT, SHELLAC SAUCE
FUMED POTATOES

ROAST ANTIQUE TURKEY, KAPOK FILLING
MAHOGANY KNOB SAUCE
LOUIS QUINZE POTATOES
RENAISSANCE STRING BEANS

LETTUCE SALAD, SATIN FINISH

FROZEN NEAPOLITAN CREAM
IN SEPARATE CRATES
COMPO CAKES
MAHOGANIZED COFFEE
ADAM'S ALE, REPUTED QUARTS
WALNUT VENEERED CIGARS

Turpentine substitute will be served as the wine is
Cawk Hell'd at Queen's Park

Serenely full the Epicure would say
Fate cannot harm me, I have dined to-day

Programme

Chairman, James Acton, Esq.

Toast

HIS MAJESTY THE KING

Song.....Frank Oldfield
Hawaiian Specialty.....Ben Hokea
Song.....Harry Bennett

Toast

OUR GUESTS THE RETAILERS

Proposed by.....Short Speech.....G. A. Gruetzner
Response.....Shorter Speech.....G. O. Luke
Response.....Much Shorter Speech.....Robert Coryell

Song.....Frank Oldfield
Hawaiian Specialty.....Ben Hokea
Song.....Harry Bennett

Roast

THE MANUFACTURERS

Proposed by.....Very Much Shorter Speech.....Joseph Dale
Response.....Say It With Flowers.....John R. Shaw
Response.....Figure It Quick.....James Ferguson

Song.....Frank Oldfield
Hawaiian Specialty.....Ben Hokea
Song.....Harry Bennett

Toast

THE HOME FURNISHINGS BUREAU

Proposed by.....Few Words.....H. P. Sullivan
Response.....Less Bull.....William Cawkell

GOD SAVE THE KING
Lyrics by Clarence Cory-yell
and the 2 Bards—Gib and Gil

Menu and programme, banquet tendered retail furniture dealers in convention in Toronto, by the furniture manufacturers.

A well planned residence with interesting features. Description appears below. Harold R. Watson, Toronto, was the architect.

Problems Involved in Designing House

Attractiveness Not Sacrificed to Utility—Making Most of Site and Surroundings—Special Attention to Kitchen

By D. A. Reddin

IN CHOOSING a plan or design for a house there is more to consider than the general appearance of the structure and the size, number, and location of the rooms. The size, shape and location of the site, the general style and value of the surrounding homes and the views of vistas with which the property is surrounded should have every consideration. In fact, if such details are not taken into account, it is not possible to make an intelligent selection of a plan or design and the result may or may not be satisfactory.

The illustrations which accompany this article show a residence designed by Harold R. Watson, architect, Excelsior Life Building, Toronto. Mr. Watson, who specializes in residential work, is very much in love with his work, and simply delights in taking a piece of ground and not only designing an attractive house that fits becomingly into the setting, but in endeavoring to take full advantage of all the possibilities which may be found in the site and its surroundings to the lasting satisfaction of the owner. In this he is unusually successful.

Special Problem to Overcome

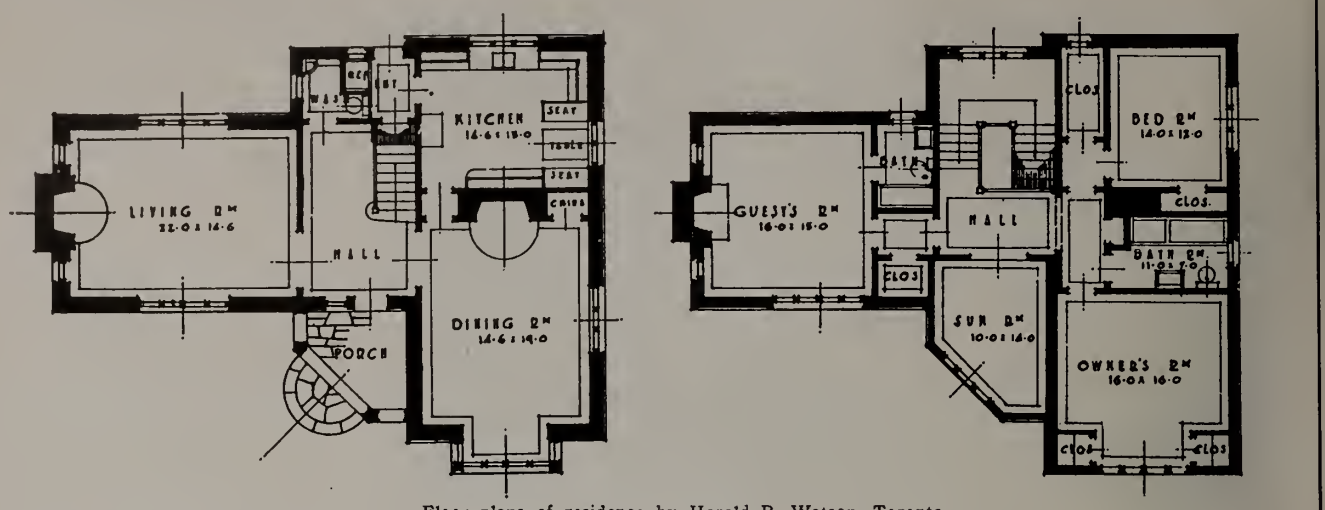
In this particular instance the problem was to work out an attractively designed home on an irregularly shaped lot, in which the location, and to a certain extent the house itself, was more or less controlled by a garage which stood on the rear of the lot. This accounts for the unusual shape and layout of this home. In the arrangement and size of the rooms is manifest the modern tendency toward a minimum number of rooms of generous proportions, in preference to a larger number of smaller rooms.

Another feature that was given careful attention was the convenient layout and arrangement of the rooms and fitments. This is particularly noticeable in the kitchen, which is practically lined with shelves and cupboards, enabling the pantry to be dispensed with. At either end of the sink, which faces a window, is found a covered tub. When not in use, the covers form draining boards for the sink. The breakfast alcove, placed in the kitchen, is another attractive, step-saving feature. Everything in this department is so planned and arranged that the work may be carried out in a minimum time and with a minimum expenditure of energy. The kitchen is trimmed in pine enamelled white.

Special Attention to Woodwork

The interior woodwork is well planned and executed. The living room is finished in quartered white oak, with beamed ceiling and deeply recessed win-

Dining room with Elizabethean panelling in quartered white oak



Floor plans of residence by Harold R. Watson, Toronto

dows. The dining room is panelled, in Elizabethean style, to the height of the window heads. Provision was made above the fireplace for a mural painting. Here again quartered white oak is the wood used. The same wood is employed in finishing the entrance hall.

The lower floor contains large dining and living rooms, kitchen and convenient wash room. On the upper floor is found a self-contained guests' apartment, with separate bath, two bedrooms, sun room, together with numerous closets. This floor is well arranged, waste space having been reduced to a minimum.

The half-timbered effect of the porch and sun room add considerably to the attractiveness of the exterior of the house. These timbers are of adzed pine and are held together by oak pins. The window frames are constructed in the same manner. The shingle roof is in keeping with the general feeling of the house, as are the quaint old Elizabethean or Tudor chimneys.

Scarcity of Mahogany

"There is a pronounced scarcity of mahogany along the West African coast this year, because of lack of sufficient rain to float the logs down the streams," said R. P. Sawyer, of Palmer & Parker, Boston, dealers in lumber and mahogany, who recently arrived from the Gold Coast, arranging for shipments of that commodity.

"Our company handles about 6,000,000 feet of mahogany a year, but this has been a very unfavorable year to get wood from West Africa. Because of the scarcity, there has been competition among buyers, forcing prices up. Mahogany logs are now costing £50, as compared with £8 and £10 before the war, and about £6 during the war. Logs average between between 1½ and 2 tons, the heaviest running up to 8 tons. Present average price is about £25 a log. In 1913, between 30,000 and 40,000 logs were brought down on the Gold Coast. The labor situation is bad, since the natives are not obliged to work.

"We are bringing over what is believed to be one of the largest cargoes of mahogany ever loaded, 2,000,000 feet, which will be docked at Boston."

During the first eight months of 1920, 31,775 million feet of mahogany, valued at $4,675,745, came into the United States. For the same period in 1919, the amount was 29,032 million feet, valued at $2,387,-907; and for the same period in 1918, 27,033 million feet, valued at $2,106,187. While total imports of mahogany for the first eight months of the current year showed a slight increase over the previous year, the value was increased almost 100%.

Spirit of Italian Renaissance Furniture

(Continued from page 72)

of painting were dried up. Scholarship has pined away into pedantic purism. Correct taste was coming to be prized more highly than originality of genius in literature. Nor did architects fail to manifest the operation of this change."

Another writer deals with the furniture of that period as follows:

"The Renaissance raised furniture making to an art. Pupils were aprenticed to master and studied with him until they had perfected their craft, when they opened workshops of their own. The pieces produced in these great studio-shops united beauty with utility. For the first time designs were made with reference to their setting. The furniture of the private dwelling was suggestive of neither cathedrals nor abbeys. It was made with a careful regard for the needs of the owner, his station and manner of living. Thus houses possessed a harmony which had hitherto been absent.

"Two pieces of furniture which assume an important place in the late seventeenth century were unknown in the early Renaissance house, and these were the bookcase and the writing desk. Bookcases, in the earlier period were made exclusively for the great libraries of Italy, and writing desks were the property of monks and scribes. In the Museum of St. Mark in Florence, is exhibited the desk used by Savonarola. It has not a line of decoration, a scrap of carving. The monks ornamented their chairs and benches, but their desks were as severe as their lives. Savonarola's desk is beautiful in its straight lines and plain surfaces, and aside from its connection with the great Dominican, has value as a piece of Renaissance woodwork."

What of Wages in Woodworking Industry?

Should Labor Bear a Share in Placing Business on a Sound Foundation by Accepting Lower Wages?—Industry Should Act as a Whole—Read the Opinions of Prominent Woodworkers

The responsibility of labor is engaging the minds of many large employers. The prices of many commodities are falling and new low levels are being struck; what proportion, if any, of this decline should be accepted by the working man. In bringing the problem home to the woodworking industry it must be favorably admitted that exorbitant prices and inflated values were not common in this line of endeavor. Yet lower prices must prevail; are necessary to stimulate building and increase the demand for all wood products.

Should the employees in the different woodworking plants shoulder a part of the responsibility by accepting a lower wage? Would it be to their advantage, inasmuch as it might mean steadier work and less unemployment? Would lower values result in more business? How do the rates paid woodworkers compare with those in other industries? Are they too high? Would they stand to be reduced, present living costs considered? What scale is being paid in your district and what is your policy toward the wage question?

Whatever the attitude taken the industry should act as a whole. If some employer put lower rates into effect while others maintain the present scale, it tends for uncertainty, competition for mechanics and lack of uniformity in prices and quotations. With this in mind some of the above questions were put to a number of woodworkers. Their replies are printed below. Read them, give the subject a little thought, and send in your views for the February issue.

* * *

Maintain Present Level

What one representative Ontario woodworker has to say: "In reply to your question, are lower wages to prevail? We take pleasure in submitting the following: 1st., they should not. 2nd., they may and probably will in the future. 3rd., on what do we base these assumptions.

"In making the assertion that wages should not be reduced, it must be distinctly understood that we are dealing entirely with the woodworking industry. In this line we have no reason to believe that there has been any exorbitant advance in wages. It is a question if the purchasing power of the wage dollar has kept pace with the selling price of the article produced. Whilst there has been a reduction in the wholesale and retail price of a good many commodities, in most cases any surplus of wages accumulated in the woodworking industry will be absorbed in the procuring of goods necessary to replenish depleted stocks of household requirements. Unemployment will also bear heavily on any surplus saved, and the workers through decreased earning capacity are not in a position to take advantage of reduced prices.

"The general welfare of all communities should be the prime aim of both employer and employed. During the last two years, more particularly, the great demand has been for greater production. This, judging by present day conditions must have been in a large measure complied with, as surplus stocks in many lines exist in abundance. There is little use in urging greater production and at the same time advocating measures which deny to many the opportunity of buying necessary commodities.

"Referring to the statement that wages may and probably will be reduced in the future, this is in keeping with what seems to be the general trend of commodity prices. Should drastic reductions take place, and goods be cheaper and with employment more plentiful, then when this fact is firmly established will be time enough to adjust wages in keeping with such conditions. There has been altogether too much emphasis placed on the wage cost of production or conduct of business.

"Where it has been frankly admitted that a 300% profit was made in woollen goods, etc., and wages were not extravagantly high, whilst we do not even assume that such conditions are general, the fact remains that in too many instances, stressing the point of extravagant wages has had a most injurious effect on both the thinking and thoughtless workers.

"The basis for maintaining that wages should not be reduced at present, but that in the future they may, is simply this. At present as far as we know woodworkers are not overpaid, and in fact have, as a rule, in the past been underpaid. Our rates of wages are at present as follows: machine operators 55 to 65 cents per hour, boys and machine helpers 30 to 45 c., bench men 55 to 60 c., yard and general help 48 and 50 c., department foreman, 65 to 90c. per hour.

"In presenting the case concisely, we may say that in the best interests of the woodworking industry as a whole, and from the viewpoint of the employer, and employed, we are fully convinced that for the purpose of mutual benefit and lasting results there should be no action taken at present toward the lowering of wages. We feel sure that where an inquiry, in sympathy with decent requirements is made, it will be shown quite plainly that those engaged in the woodworking industry are not receiving much if any more than what is generally termed a living wage. In fact many of them instead of being profiteers are financiers in the best sense of the word. Whilst in a large measure we have an obligation to our business, and the community, we also have a large responsibility in the matter under discussion.

"Whatever action is taken if we all play the game fairly, and with mutual understanding, we need have no fear of the future."

* * *

Lower Rate to Prevail

How a Nova Scotian views the question: "We have your favor of the 4th, asking for an expression of opinion as to wages applying to this industry. The writer's opinion is, that a reduction of say 10% should become effective immediately. As a matter of fact, we expect to make it effective in our plant on the 17th instant. The cost of living has at last started on a decidedly downward movement, and as the present rates were introduced when costs were at their peak, it is only reasonable that the workers should content themselves with a reasonable reduction. Indeed I be-

lieve such a step necessary in order to bring down building costs, and thereby stimulate construction.

"There seems to be a universal idea now prevalent with the public, that these costs must tumble, and they are therefore witholding their work until a decided reduction takes place. Work is not at all plentiful, and if costs come down, there is no doubt an impetus will be given building operations, and in order to bring this about, the workmen should be willing to do their part. The rates we are paying at present are as follows: woodworking moulder men, 67 to 80c. per hour, other machine men 45 to 67c. per hour, bench men 50 to 60c. per hour, machine and equipment repair men 40 to 60c. per hour, factory helpers, 40 to 42½c., yard men 40c., shippers, 40, 45 and 50c., and teamsters 40c. per hour.

* * *

Rate Too High in Comparison

A Kitchener manufacturer replied as follows:

1. "Are lower wages to prevail? Yes, somewhat.

2. Shall wages in the woodworking industry be reduced or maintained? Reduced.

3. Labor costs are high, yet would a cut in wages result in any increased demand for wood products, due to lower prices? A reduction in wages would have a tendency to increase the demand somewhat.

4. Are our mechanics and laborers receiving too high a scale, rates in other industries and present living costs considered? Rates in other industries and cost of living are gradually being reduced and our mechanics and laborers are therefore receiving too high a rate in comparison."

* * *

Quebec manufacturer will maintain present scale: "We employ 80 men and under ordinary conditions work an average of 10 hours per day. As business declines, my policy is not to reduce wages but to cut down the hours so as to distribute all work as evenly as possible. At the present time we are working eight hours per day

"I do not think the present moment a propitious one in which to put in force a general reduction in wages. While living costs have declined slightly, I do not consider that current prices justify any decrease in the rate paid. We are paying the following rates: carpenters, 40 to 55c. per hour, machinists 30 to 55c. per hour, journeymen 25 to 30c. per hour, boys of 15 and 16 years, 15 to 25c. per hour and teamsters 25 to 30c. per hour. This works out on an 8-hour basis to about $4.00 per day to carpenters, $3.00 to machinists, $2.40 to journeymen, $1.60 to boys and $2.40 to teamsters.

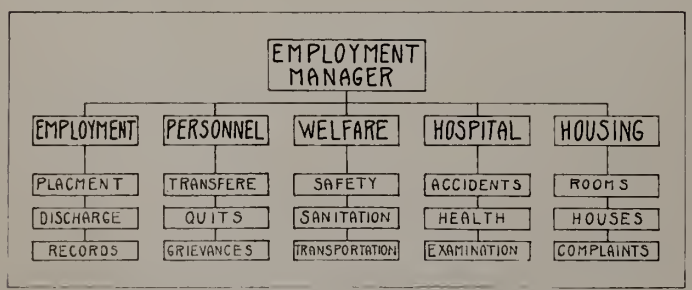
"Conditions in Quebec never reached the extremes touched in such cities as Montreal, Toronto, Halifax, and other centres. Any general reduction in wages paid to woodworkers should commence in the larger centres and gradually extend to the smaller towns. Another point is that when business is good and work plentiful, we find it extremely difficult to secure good workmen and, therefore, find it necessary to maintain wages."

Advantages of Organized Employment Dept.

Efficient Employment Manager Promotes Good Feeling—Fills Peculiar and Valuable Position—Connecting Link Between Management and Men—Authority Over Wages, Hiring and Discharging

By R. J. Waldo

At the present time when there is a surplus of labor and when every unnecessary move must be eliminated to reduce the cost of a commodity, an employment department is of vital importance to any organization. This is equaly as true now as it was during the recent labor shortage. At that time an employment department was engaged in searching for employees of the highest type available. Now they are picking out from among the applicants those who possess certain qualifications which make them of greatest value to the firm employing them.



Activities of employment department outlined.

The employment department is just as valuable now as it has been for the past few years. There are certain responsibilities which have been assigned to it that must be exercised with even greater care than during the past three years. Only a few months ago it was hire every man available and place him somewhere. Now it is hire the best men of those who apply and place them where they can render their most valuable service.

The Employment Department and Society.

The employment department renders one of its greatest services, when by carefully placing a man, it brings out the best there is in him and makes him more responsible. Making a man more responsible makes him not only worth more to the company but to the community. The man in a position of responsibility, or in a position which calls for his best efforts, feels that he must be something and that in itself makes him look at himself and determine where he may brush up and be worth more. Giving a man responsibility has often awakened a valuable talent which he never realized he possessed.

The employment department is so situated that it is often called upon to render a valuable guiding hand to the man who comes in undecided. In my experience many a man has appeared before me asking for any old thing as long as it was a job. Such men often prove valuable. In placing these men where they can develop and where they may become more responsible, the employment manager renders his greatest aid both to industry and society. Whenever you show a man that he is somebody and that you expect something definite from him which, possibly, you let him think no other man can do as well, he begins to take a new

grip on life. Many a man has taken a new grip on his life when sitting before an employment interviewer.

Even though the industrial world feels that they are not operating their plants for the benefit of society, they must admit that they are seeking the best of human endeavor, that they may reduce their price a little below the other fellow's. This has been going on in industry for years and will continue. If an organization benefits by selecting efficient men, the community benefits also. This is so because a better class of men are being educated. The industrial world also gains through increased orders.

I mention this simply to show why more care should be taken in selecting men. This can best be accomplished through the functions of the employment department.

Should Not Show Partiality.

Partiality, the cause of so much unrest in industries where there are no employment departments, is

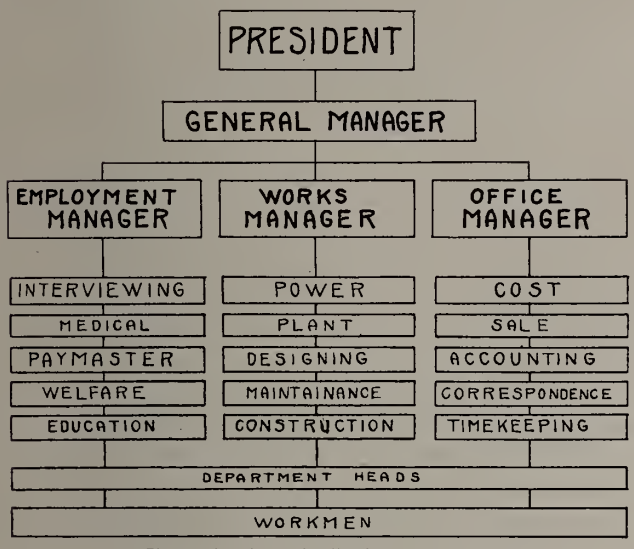


Chart showing distributions of responsibility

gradually becoming a thing of the past. Managers are beginning to realize that to have a contented force they must weigh out an equal chance to all. Many firms, and these our largest, have shown partiality to their men because they had no way of determining whether it was being done or not. At least the managers were ignorant of the fact.

The non-partial employment executive will save many a good man by his impartiality and will thus make a good reputation for his company. However, many executives will say that they do not care about their reputation among their workers. All they care about is their reputation among their buyers. Little do they believe they are the same thing. Dissatisfaction among employees has lost many a good sale among buyers.

A Disinterested Go Between.

The employment manager then becomes a disinterested go-between man and employer. He should be hired with the understanding that he must be strictly neutral. He must make all his decisions without prejudice and let nothing influence his decisions except his desire to do that which is fair and square for both man and employer. He must look squarely at the facts and even though the employee be his own son he must be ever willing to let him go if facts show it to be desirable. In my experience of hiring I have employed a foreman who at one time had laid me off. The man who hires must be able to size up a man and if his experience and capabilities warrant it, hire him.

The employment manager because of his peculiar relation to industry is in an ideal position to win the friendship of every man employed. He can often do a favor for them which they will long remember. Perhaps some employee has a friend who wants some employment of a special nature. Perhaps he has been sick and can not do hard work. Often by a word or two from the employee the hiring may be practically completed before the man calls in person.

In modern industry the employment manager must decide upon all wage increases which are made. This he must do in a strictly conscientious manner and never give a raise simply because a man wants it, but ever be ready to give a raise to any man who is worth it regardless of who he is. This wins interest and self-respect and nothing is of greater value to an employer than a man who respects himself.

Where Does Employment Manager Stand?

Just where the employment manager stands varies in different organizations. However, if he would be most efficient in his work and be of his greatest value, he should be equal to the works or office manager. However, he will do many things beyond them, yet in charting an organization the employment manager is shown on a level with them. He should have direct access to the highest officials of the company, as should each and every employee have direct access to him. To be most valuable he must be, at once, on the level with every man in the organization. He should be approachable by every man whether a sweeper or the treasurer of the company. He thus wins the respect of every worker and in turn renders a valuable service. A chart showing his place in the organization is shown in sketch No. 1.

A brief outline of the principal functions of the well-designed employment department might be advisable. Only those applicable to the smaller organization are given. These are shown in Chart No. 2. In the larger organization these may be broadened out a great deal to efficiently handle every sort of requirement that might come up.

Treating Oily Belts

It is not at all unusual to find a belt or belts that are giving trouble because oil splashings have reduced them to the consistency of oily rubber. Also is there a certain type of mechanic, whose duty it is to keep the machines running, who thinks that the very best thing to do under such circumstances is to apply lime to the belt, with a view to drying off the oil.

Granted that an oily belt will not develop the power it should, and that some form of absorbent in powder form will generally react on the oil and make the belt pull better; but in such circumstances lime is about the very last thing that should be applied. Far better is it to treat an oily belt with a non-corrosive powder, such as chalk or Fuller's earth, but even then it does not follow that this should be made a daily practice. The correct thing to do in such cases is to stop the oil getting near the belt—cover it with a guard or some other protecting device. There are very rare cases in which this cannot be done, then when the belt shows signs of becoming unduly hard, as naturally follows when all the oil is dried out of it, it is advisable to restore suppleness and pliability by applying periodically a good standard brand of belt dressing.

New Idea in Industrial Lighting

Mr. Doane Makes Startling Suggestion—Importance of Time Factor Not Realized—How Poor Lighting Retards Production—Tendency Toward Still Brighter Lighting

By S. E. Doane*

There is one new dominating thought in the industrial lighting field that I will atempt to make clear. It will be more clear if I neglect to mention other factors, such as lack of glare, uniformity of light distribution, sufficiency of shadow, etc., consideration of which time forbids.

The illuminating engineering profession is only just fairly grasping the thought that there is a time factor in seeing which is profoundly modifying our practice and our views. It may be that this society has not had presented to it, the illustrations with which the illuminating world is now familiar, which brings home to us the point which I will try to make.

How Time Factor Applies.

The opposing tennis player at twilight can see the ball in the hand of the player about to serve. The ball may become entirely invisible the minute it is put in motion. You are all familiar with the experience, but we have not applied the fact that it indicates until very recently. If we think of the tennis ball we will realize that the ball in sight before it is served and the ball in motion after it is served, is of the same color, has the same amount of light on it and if there is no time factor in sight, should be equally visible whether in motion or at rest.

The man walking along the dimly lighted storeroom may trip over or bump against something which is perfectly apparent when he stops and views it. If the man should stand still and we should put the object in motion at the same speed at which the man was progressing when he ran into the thing over which he tripped or with which he interferred, he would probably find the same difficulty in seeing it as the player does in seeing the moving tennis ball.

Like Photographic Plate.

Laboratory tests have been designed and study is progressing to put values in fractions of a second to the speed of vision under various conditions of quantity and quality of light; in amount of contrast between background, etc. The subject in the course of the next few years will be well understood but just at present our application is running ahead of our exact knowledge on the subject. It is perhaps enough to say that the retina of the human eye behaves so much like a photographic plate that if you will consider your experience in photography you will have a fair start on this problem of speed of vision. When the light is dim we make a longer exposure on our photographic plate, in order to obtain the same picture which we can obtain with less exposure when light is bright. The human eye behaves in just this way. There is ample evidence now to show that the brain receives no notice whatsoever that the picture is being recorded on the retina of the eye until the time such exposure reaches some definite value which is a function of the light intensity. The time that the eye takes under practically all conditions of artificial lighting is measurable in considerable fractions of a second. If you were photographing the tennis ball in motion, you would have to photograph it so quickly that it apparently would not have moved from the beginning to the end of the exposure. This would be impossible in dim light. In watching the flight of the ball, the human eye must do just this thing and it must sufficiently recognize the motion of the ball to keep that ball so clearly in focus in the eye that its course can be traced. This is impossible in light which is dim, although it is quite possible that the light may be strong enough to make such a photographic impression on the eye if the ball be at rest.

Retards Speed of Workmen.

Just imagine your attempting to photograph the obstacle in the warehouse over which the employee tripped, against which he walked, without hesitating, and you will see why it is that I say that this speed factor of sight is destined to become a very important factor in safety lighting.

Just one word as to the application of this new appreciation or knowledge in industrial lighting. We think of the workman at the bench, as he reaches for his pliers, hammer, file or some other tool, as merely reaching for the tool, we do not visualize him as making a mental photograph of the bench and then reaching for the tool at the spot indicated on the photograph. The facts are, however, that he does take such a mental photograph and that it takes time to make it if the light be dim and consequently instead of good lighting or high intensity lighting stimulating acuity, it should be stated that dim light is a barrier or a brake on acuity which brighter lighting removes wholly or in part.

Many factors enter into this better lighting programme. It is more than ever obvious that glare is a greater detriment and more objectionable than we had imagined. It is also entirely obvious that the contrast between light and shadow by which objects are defined, is a much more important thing than we would imagine. If your mind is not clear as to this, think again of your camera and how you would photograph or how you would like to photograph.

More Light Required.

I just suspect that each one of you is saying, how brightly should we light our work shops. I will forestall your question by saying, we do not know, we have never yet so brightly lighted any shop that the owner, superintendent or foreman agreed to have it less brightly lighted. We are gaining courage as the months pass and know now that if we had had the courage of our conviction a year ago we would have lighted much more brightly than we did then and it may be that a year hence we will light much more brightly than we do now.

As an interesting indication of our progressing thought I will instance; one of our machine shops which we considered sufficiently lighted and which was lighted at an intensity of twelve foot candles four years ago, has recently moved to a new location. We lighted the new plant at twenty-five foot candles.

*Address, New York Section, Illuminating Engineering Society, New York.

Why Are Electric Installations on Increase?

More Interest Being Taken in Motor Drive—One Manufacturer Says Cuts Fuel Bill in Two—Takes Care Surplus Power Requirements

By P. E. Poole

A representative of one large manufacturer of electric equipment recently made the statement that his company sold a larger number of motors to woodworkers and furniture men during 1920 than ever before in the history of their organization and that they anticipated increasing their sales in this field during the next twelve months. Why are electric motors so popular? Are they superior to any other form of drive? If they have any special advantage over steam equipment or if the adoption of the motor drive will enable any woodworker, not using electric power, to cut down his overhead expenses, increase the efficiency of the plant, and save money, the "Canadian Woodworker" believes that information on this subject will be read with interest. To this end articles dealing with different phases of the electric drive, as applied to woodworking plants, are scheduled to appear in the next few issues.

Probably one of the most potent reasons why the woodworking industry is turning toward the electric drive is the ever-present possibility of a coal famine and the high prices which this commodity commands. During the winter of 1920 coal was scarce and at a minimum and many manufacturers were faced with the possibility of having to close their plants, due entirely to their inability to secure an adequate supply of fuel. This experience may have caused many to consider electricity as a source of power. However, there are certain advantages and economies, which go hand in hand with the motor drive, which have a strong appeal to all practical men.

Some of the Advantages

With an electric installation, where two or more motors are connected up, a more even distribution of power is secured. That is, motors may be placed where the power consumption is heaviest, doing away with many of the losses common to line-shaft and belt transmission. Thus the adoption of the group or individual drive effects a direct saving in the amount of power consumed, owing to the complete or partial elimination of transmission losses. Another feature is that with the group drive, one motor driving a limited number of machines, the groups may be operated as independent units. If one group is not in operation there is a direct saving of power. This is particularly advantageous when work is a little slack.

Just a word about the different drives. There are three types of electric installation—individual, either direct connected or belted, group and unit drive. In the latter type one motor provides power for the whole plant, which is distributed through the usual transmission system. The individual drive is the most efficient, but is also the most expensive to instal. The manufacturers of woodworking equipment have shown their appreciation of the direct connected electric drive by designing special machines, such as saws, moulders, shapers, etc., in which provision is made for attaching a suitable motor. The idea has been carried even further as in some instances the different spindles are each made part of motor rotor and the motor becomes an integral part of the machine.

Would Not Revert to Steam

The views and opinions of a few woodworkers, who are using electric power should be of interest. One operator of a large planing mill, when approached on this question, had this to say: "It is the only power when you can get it at a reasonable price. We use 53 h.p. which costs us on an average of $90.00 per month. You will see that you could not hire a man for this and the wear and tear on a motor as compared with a boiler and engine is nil. With electric power the motors can be so placed that they will give the maximum service. We have been using this power for over 20 years in our planing mill. Previous to that steam, but would not go back to steam unless compelled to for the lack of electric energy. At the present moment we are operating 5 motors, totalling 53 h.p.

"Disposing of the shavings is certainly a big item. We firmly believe they can be converted into a good paying proposition just as well as rags and waste paper. Why not the "Canadian Woodworker" start the ball rolling, by encouraging some one with a little capital to collect the shavings and waste from planing mills and convert it into alcohol or pulp. We are of the opinion that a large proportion of the planing mills are operated by electricity. For some enterprising person, or company, to collect the waste and bring it to one centre and there convert it into something valuable, should be a paying proposition. It does seem to us a great waste and needless expense to, in our rush season, to have to draw them to the dump, for generally in that season one cannot dispose of them baled. We have installed a baler but find it very difficult to sell them."

Cut Fuel Bill in Two

Several furniture manufacturers were asked for their opinions and experience with electricity as a form of power. One furniture maker in Western Ontario, who recently put in a number of motors, has this to say: "We have just installed a group drive of seven motors, comprising 240 h.p. As the installation has been but recently completed, we cannot as yet give you any figures, but there is no doubt but what we are receiving excellent results. We have purchased all new equipment, and the machines perform beautifully. The drive is so arranged that we can hook up our steam in one hour, should something unforeseen happen to the power line.

"There are many advantages in a motor drive. For instance, we can run any group in our plant separately, and in quiet times, which we are experiencing just now, this makes a big saving in the power bill. We have a separate motor running the shavings fan. This refuse goes direct to the boiler where it is used for heating purposes, and drying lumber in our kiln.

"Regarding the financial end, which is most important, the amount of power we use, we expect, will cost us at the rate of steam coal at about $6.00 per

ton, a figure we never expect to see again. Of course against this is the first cost of installing the motors, but we are satisfied that we can cut our fuel bill in two and have a much more satisfactory drive, and there is no doubt but that Hydro rates will decline in the near future, giving us an additional advantage.

"We should impress on any woodworkers who contemplate installing motors, to be sure and purchase machines of ample capacity so that the motors will not be overloaded and thus retard their proper performance. A motor that is overloaded will consume more current than a machine of ample capacity. We, in our plant, took the peak load of all of our machines, and purchased motors to do the work in groups according to required h.p. as shown by these tests."

Supplement Steam Installation

It is sometimes argued that a plant requiring steam for heating and drying purposes, would find it more economical to operate on steam power, using the exhaust for heating and drying purposes. This might hold true if sufficient waste material were produced to supply the fuel requirements of the boilers. Where the amount of shavings and waste produced must be supplemented with coal, the power generated from the coal costs more than a similar amount of electric energy. That being the case, it would appear that the logical solution would be to operate a steam plant of sufficient capacity to provide only the amount of exhaust steam required to heat the plant and kiln and to instal motors to take care of all power requirements in excess of the capacity of the steam plant.

This is the policy by one successful woodworker who says: "The way we are situated, electric power is a convenience to us, but the nature of our business makes it necessary for us to operate a steam plant, as we require steam for dry kilns, plant heating, etc. By utilizing the live steam for power and the exhaust for heating our factory and kilns the steam plant uses up most of the factory refuse, so we have no difficulty in disposing of this waste. We use electric motors to drive isolated machines that cannot be conveniently connected up to the line shaft with belts and also to furnish the power we require beyond the capacity of our engine."

Cross Arms From B. C. Fir

The woodworking plant of Wm. Shirton & Co., Dunnville, Ont., presents a very busy appearance at the present time. This industry is an old-established one and employs from 15 to 20 men the year round. Wm. Shirton, the founder of the business, died about 12 years ago, and it has since been ably conducted by his son, K. J. Shirton, who is one of the most enthusiastic members of the Ontario Retail Lumber Dealers' Association.

The district in and around Dunnville is a great natural gas one, and some five years ago Mr. Shirton sank a gas well. The depth is 800 feet. A 6-inch pipe goes down 500 feet into a pocket of 250 feet depth. Until the latter part of 1919 natural gas was used for driving the equipment of the mill but now a 25 h.p. Westinghouse moto is employed and the gas engine is kept as an auxiliary in case anything should go wrong with the hydro-electric power. Natural gas, however, is used for heating the building and offices of the firm.

Mr. Shirton has a large contract with telephone and telegraph companies for the supplying of cross-arms, which are made from B. C. dimension fir. In regard to cross-arms for telegraph and telephone poles, he says that his company uses B. C. fir almost exclusively. Roughly speaking, the size that they employ to the greatest extent is 3¼ x 4¼ finish measurements, although they manufacture a small quantity of 3 x 4 and occasionally 3¾ x 4⅜. They will furnish about 60,000 cross-arms this season and state that this business for 1920 has not been in excess of the normal output.

Continuing, Mr. Shirton says: We have been in the cross-arm business for about fifteen years and are quite well established, although it has been rather a slow process to build a up a trade in this particular line. We do not hesitate to state that B. C. fir is, in our opinion, the most suitable wood to use for the purpose, although long leaf Yellow Pine is a very close second. We believe, moreover, that all other things being equal we should give our Canadian firms this business and are resolved to adhere to the former wood as long as it is procurable at anywhere near the price of the American product. Norway pine, although light in weight as compared to Georgia pine, is very often too knotty thereby imparing the strength. Otherwise this wood compares quite favorably with both fir and Georgia pine.

Andrew Malcolm, Vice-President, Andrew Malcolm Furniture Co., Limited, Kincardine and Listowel, Ont.

Furniture Manufacturer as Mayor

Andrew Malcolm, Listowel, Ont., vice-president of the Andrew Malcolm Furniture Co., Limited, of Kincardine and Listowel, Ont., was elected mayor at the civic elections recently held in Listowel. Mr. Malcolm, who is a son of the late Andrew Malcolm, founder of the firm, has resided in Listowel for the past eight years, being in charge of the Listowel factory. He has always taken a great interest in public affairs and has served on the Hydro Commission of Listowel for six years; in fact it was largely due to his efforts that the Hydro power was linked up to Listowel. Mr. Malcolm served as councillor during 1920 and, as stated, has now been returned as mayor. In this connection it might be mentioned that he polled the largest number of votes ever cast for mayor in any municipal election in Listowel.

Order No.	Date	Name	Address	Description	Material	Quantity L. Ft.	Quantity Sq. Ft	Price	Bench Work Hours	Bench Work Price .85	Machine Work Hours	Machine Work Price 1.30	
6	June	Tom Smith	Cayuga	Counter, etc.	Pine Flooring		130	12.35	3½	2.98			
	" 9				2×6 Pine		30	2.70			2¾	3.58	
	" 10				1½ Pine for Sash		34	4.08	5¼	4.46	4	5.20	
	" 11				Oak for ½ V Mould		65	13.00	7	5.95	1	1.30	
	" 12				Glass stops Pine	125		3.60	4½	3.83			
	" 14				Top and Bottom		32	6.40	3½	2.98			
	" 15				For Casing Pine		8	.80					
	" 16				Oak Cove	20		1.25	4	3.40			
					Window Slip	110		3.30	6½	5.53	1½	1.95	
				(D)				47.38		29.13		12.03	88.54
								$88.54 Cost of Job					

Form "D" which constitutes the cost book.

How Fred Barraclough Keeps Costs

Planing Mill Operator Has Worked Out Simple System—Knows Exactly What Each Job Costs—Information Secured Invaluable as Basis of Estimating

By H. A. Rolphe

What a boon it would be to the woodworking industry; what a boost for greater efficiency, if every member were to keep accurate account of his overhead and costs and base his estimates and prices on the cost of production. When one considers the many advantages to be derived from knowing costs, it is hard to understand why some simple method of cost finding is not in general use.

If the operator of every planing mill or sash and door factory knew the exact cost of each job turned out, he would take pains to make sure that profit was forthcoming on every item, and more than that, the experience gained and figures compiled on work completed, would serve as a valuable guide when estimating new work. Thus to a certain extent blind, cut-throat competition would be eliminated, for the average man would hesitate a long while before quoting a figure or accepting work at a price below what it would cost to turn it out. It is the person who does not know his costs, who guesses blindly at prices, and who thinks he can do work as cheap as, and even cheaper than, his competitors, who plays havoc with prices and is responsible for a continued feeling of uncertainty within the industry.

Cayuga Planing Mill Co.

Mr. Tom Smith Date May 30th 1920

June 30th (When Wanted) Cayuga (Address) 66 (Phone No.)

Order No.	DESCRIPTION
6	1 = Counter & Fixtures as per Drawing

Tom Smith

Form "A" used upon which all orders are entered.

Alive to Advantages of Accurate Figures

Fred Barraclough of the Cayuga Planing Mill Co., Cayuga. Ont., does not do any guessing as to his costs, neither does he leave anything to chance. He has given this question close study and has evolved and installed an efficient cost system of his own. He knows exactly what his overhead charges are and how they should be distributed, the average daily or weekly production of each man in his employ and the exact charge to make per hour for bench and machine work. Armed with this information he does not find it necessary to guess that the price for a certain piece of work will be "around" a certain figure or "about" so and so, but is able to state positively that it will cost so much and knows when making such a quotation that he will make a fair and satisfactory profit.

The Cayuga Planing Mill Co., conduct a general woodworking business consisting of hardwood flooring, interior woodwork, sash and doors, odd job work and general sawing. When a customer comes in or when an order is placed, the order is taken down on form A., and which, as far as possible, is signed by the purchaser. This order form gives such information as particulars of job, when wanted, name and address of purchaser, phone number, if any, and order number. A duplicate copy is given to the customer.

Close Tab on Workmen's Time

Form "B" is the workman's time sheet or ticket. The mechanic fills out the order No., name of job and accounts for all his time on this form. In the sample shown he spent 3½ hours bench, on order No. 6, 3 hours machine, order No., 10, ½ hour oiling equipment

and 1 hour, shop, fixing belts and other unproductive work. Thus no matter on how many different jobs on which a man spends time, a full accounting is made. Entries are made from the time tickets into cost book, form D., and also into time book. That means that an accurate account is kept of all time expended.

The form "D." which is in reality a page from the cost book, except that two headings "rough" or finished" are omitted. This book is similar to a ledger, index and all. The form is self explanatory. With it one is able to keep track of each job and of each item entering into each order.

Time and Material Work

Describing Form D, Mr. Barraclough says:—"The job shown on Form D was one that we took to make. We agreed to do it for whatever it cost on a basis of material and 85 cents per hour for bench work and $1.30 per hour for machine work. I showed the customer how I would keep track of same, to which he replied he did not think it could be fairer and that I would be getting a reasonable profit and him a fair price. We get a lot of these kind of jobs. About the only fair and sure way of doing them is by the hour and, by this system, it has been no trouble to me to keep track of everything. While help has been scarce and I have been at the bench myself, I have let things go for a few days without entering up, but my day cards were there, and I could carry out the task in short time."

The remaining form "C," is a stock sheet or stock bill, upon which the workman enters all material as he gets it. This sheet gives a lot of valuable information, such as the amount of material, kind of stock, rough or dressed, grade, from where secured—the racks in the storage shed are all numbered and the workman is required to give the number of the rack from which he takes the material. The material in each rack is entered in the stock book and the material withdrawn is checked off from the material bill, so that in reality it enables a perpetual inventory to be kept as well as keeping close tab on all work. "Mill" is where all the finished material is stored. As the workman enters his time on this sheet as well as on the time tickets, it constitutes a double check on the workman's time.

Application of Burden

One can readily see that the information secured from these forms together with a proper allowance for overhead, would give the exact cost of each job. Overhead would include such expenses as office and managing, unproductive work in factory and yard, charges for insurance, taxes, depreciation, interest, etc.

For Tom Smith

Order No.	DESCRIPTION	Bench Work	Mach. Work	Shop	Oilh
6	Counter, etc	3½		1	½
10	Jno. Jones, Sash		3		

Workman L. Bateman Date June 8 1920

Form "B" the time sheet of the workman.

There are different ways of figuring and applying the overhead or burden charges. The article, which appeared on page 87 of the December "Canadian Woodworker" deals with this point in detail and outlines the method adopted and recommended by the Millwork Cost Information Bureau of Chicago.

A circular saw set with a hammer will not cut so cleanly as one set with a gauge and saw-set.

Many woodworking machines are now equipped with ball bearings and all the important moving parts.

CAYUGA PLANING MILL CO.

Tom Smith (Customer's Name) Counter etc (Description) June 16/20 (When Completed)

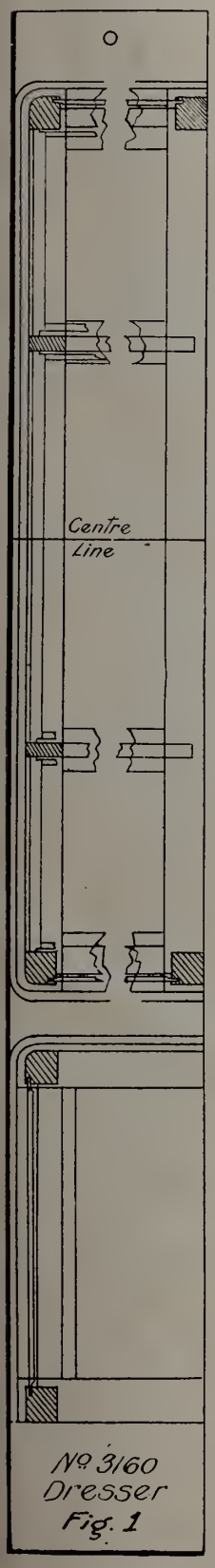
Date	Order No. = 6	Material	L. ft.	Sq. ft.	Finish or Rough	Clear or Mill	Rack or Mill	Bench Work	Mach. Work	Employees Initial
June	8	Pine Flooring		130	F			3½		L. B.
"	9	2X6 Pine		30	R.	M.	3		2¾	" "
"	10	1½ Pine for Sash		34		C.	M	5¼	4	" "
"	11	Oak for ½ V match		65	R.		M	7	1	" "
"	12	Glass Stops, Pine	125		F		"	4½		" "
"	14	Oak for Top & Base		32	R.		"	3½		
"	15	for Casing, Pine		8	R.	C	6	4	2	" "
"	16	Oak Cove	20		F		M.	6½	1½	
		Window Stops	110		F		M.			

Form "C" which is stock sheet of material used on job.

Can You Make "Rod" Showing All Details?

Ability to Read and Make Rods Valuable Asset—Suitable for Furniture, Phonographs, Show-cases and all Forms of Cabinet Work—Try These Suggestions

By H. B. Beattie



A working drawing on heavy drafting paper seldom survives one run through the factory. I do not mean by this that a drawing is totally unfit for further service, but it is certainly contracted and defaced owing to the paper being creased and otherwise mishandled during the process of machining the piece of furniture it represents. Invariably a splash of tobacco juice adorns its margins. I have even known an important detail to be entirely obliterated owing to the user "shooting short" in putting a barrage over on the spitoon. Then some careless oiler, in oiling loose pulleys on counter-shafting, is sure to let oil drop down on the drawing if it should happen to be left directly underneath, spread upon a truck or table.

This is where the advantage in the use of rods comes in. A good rod, upon completion, is shellaced over and thus is immune to attacks from oil and moisture, besides being easily handled, and having all the information thereon required. Of course a proper working drawing must be made in the first place in order to make the various patterns required. If the factory is staffed with good mechanics, a lot of the usual detail may be omitted, but where a comparatively green staff is employed, everything must be clearly set forth on both drawing and rod; otherwise foreman and superintendent would have a merry time of it.

How to Proceed With Work

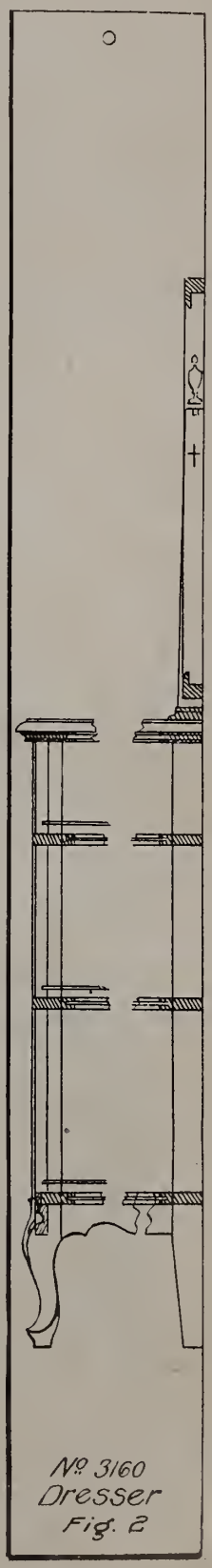
Rods may be made in various sizes, according to the nature of the work for which they are intended. A convenient size for medium and high grade case goods being 84" x 10" x 3-8", while shorter ones answer nicely for chair purposes. Phonograph cases can be shown to advantage on a rod measuring a couple of inches wider than the case itself, to allow a suitable margin and some six to eight inches longer than the total height of the case to allow for the inscription and other written particulars either at top or bottom, as preferred.

In every instance, clear white bass-wood should be used. placed and sanded both sides to 3-8", jointed on one edge, and then ripped with fine saw to insure both edges being parallel. Give one coat of white shellac or good substitute and lightly sand with fine sand paper. This shellac forms a good working surface and keeps the rod from becoming dirty and smudgy. A small twelve-inch steel blade T square, and a pocket knife with the blade dubbed off at an angle and sharpened, and a specially constructed gauge forms the principal weapons of attack. Several bottles of colored waterproof ink (Higgins), and a fine pointed pen, to show end-wood or other particular points, sets the rod off, and enables it to be more readily understood.

Start With Centre Line

It is the best policy to leave the rod until either a sample case or the whole batch is run for the first time. Then any change in construction or minor detail, that may be deemed advisable, can be made on the rod and on the new stock bill—for it is also a good plan to use only a paper stock bill for the first run, then when the rod is made the stock bill with any changes, may be re-written on the permanent cardboard one, which should be sprayed with shellac to keep it clean and legible. Spraying is better than coating as the former method does not tend to pull the ink. A check-off column should be left white so as the swing sawyer or rip sawyer can check off with pencil each item as fast as he gets out the required qualities

In showing the longitudinal plan, the best method, at least to the writer's notion, is to start with centre line (See sketch), and in the case of a dresser for instance, to follow by laying out the length of the top, then the posts are set to the proper distance in from the edges of the top, or altered slightly to allow a convenient measurement for length of front rails, drawer fronts, etc. In working from this centre



line everything balances up nicely, errors are quickly located and measuring is fascilitated. The "end plan" can generally be shown on the same side of the rod (See Fig. 1). This is so arranged to show length of gable rails, bearers, guides, drawer sides, etc., and width of gable panels, drawer divisions, and all other dimensions necessary to complete the purpose of the longitudinal plan.

Number Items to Correspond to Stock Bill

On the other side of the rod (See Fig. 2) the cross section is laid out, showing height of case, length of posts and gable panels, width of front and back rails, shapes of mouldings on tops and under frames, shapes of feet and detail of carving, if any. Each item on the rod is numbered to correspond with the number on stock bill, which was numbered originally when paper drawing was made. When every number on "stock bill" has been accounted for on the rod, and any special instructions as to boring or shaping have been written or printed on, the rod is shellaced again which preserves the work and keeps it legible. A hole is bored in one end, and after use it may be hung up in a convenient place until another lot is "broken out."

Before starting to "ink in" anything on the rod over the shellaced surface some French powder should be sprinkled on and rubbed off lightly with a cloth. This prevents the ink from creeping or rolling up. All straight lines should be scratched in either across the grain with a knife and T square, or with the grain, using the gauge. To darken these lines where necessary, a lead pencil sharpened flat like a chisel and drawn along these furrows or scratches, leaves them as dark as an ordinary pencil line.

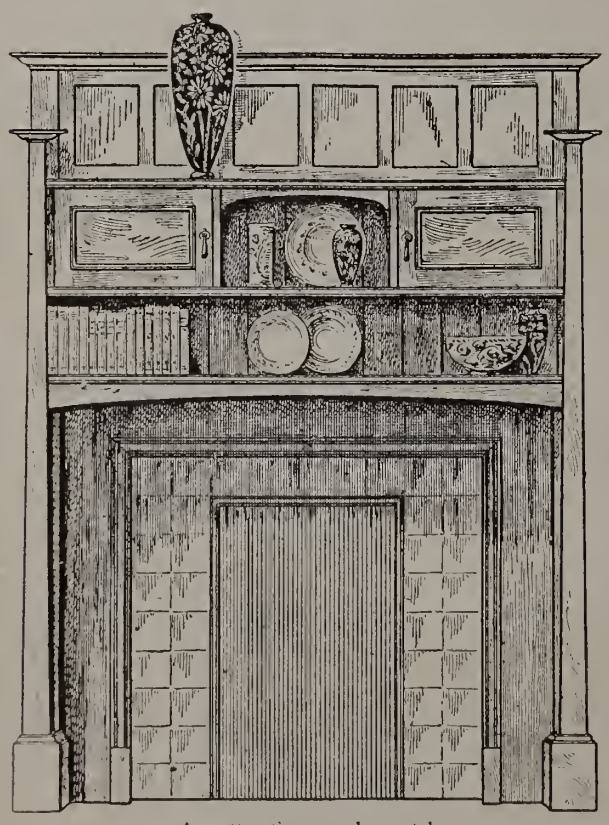
This may seem to be a very lengthy process, and a lot of bother, but from actual experience, in several factories, it is time well spent.

Mantel Important Fitment in Home

Design and Details of Mantlepiece—Dimensions May be Altered to Suit Requirements of Any Room—Deserves Careful Treatment

By R. M. Dearth

The decorative value and the importance of the mantelpiece is becoming more and more recognized. This piece of home furnishing often makes or mars a room. The accompanying illustrations show a design for a plain but attractive mantel that should fit in well with the decorative scheme of the modern



An attractive wood mantel

home. Should a plate rail be used it would be well to keep the top of the mantel in line with the rail. This can be used with either coal or gas grate or electric heater

The size given is only suggestive as individual requirements differ. The dimensions may be modified to suit the requirements of any room. The design can in fact be adapted to almost any existing fireplace and if the size has to be altered all that is necessary is to draw a new scale and work to it.

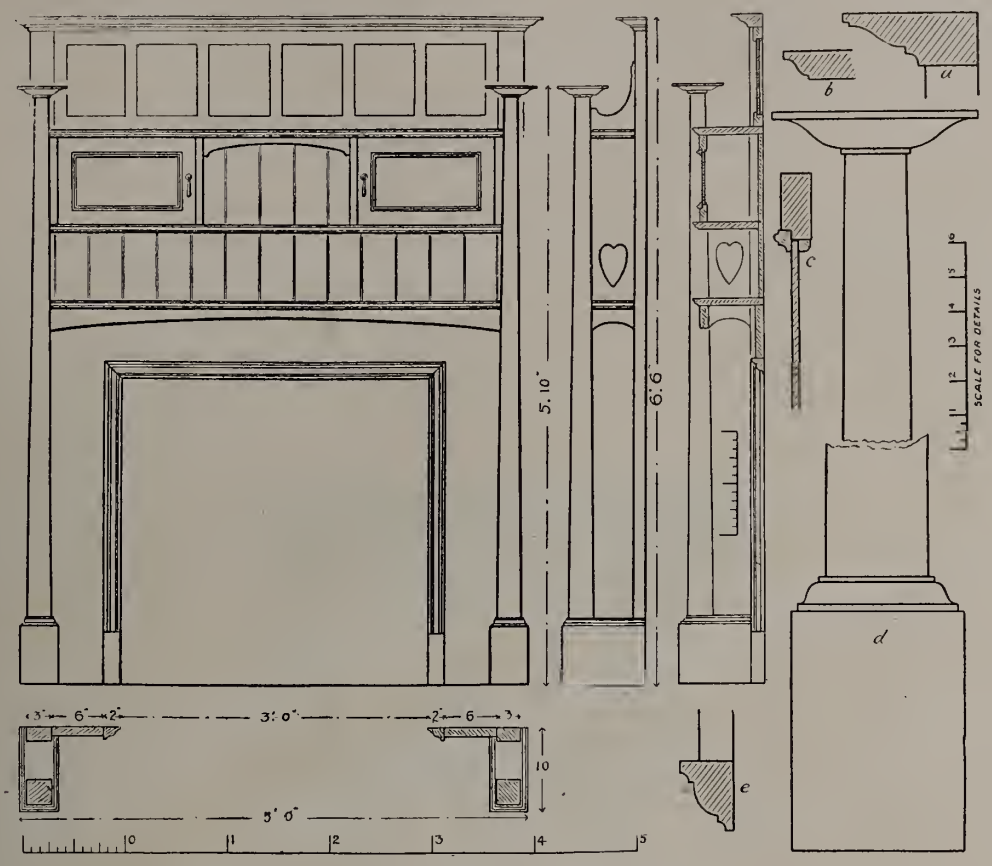
In the illustration shown the total width over the plinths is 5 ft., and the extreme height at the back 6 ft. 6 inches. Between the plinths the width is 4 ft. 2 inches. The height to the first shelf is about 3 ft. 9 inches so that ample provision is made for dealing with any existing fireplace. The height of the middle (or cupboard) shelf is about 4 ft. 6 inches, whilst the top shelf is about 5 ft. 5 inches from the floor, about eye level. The cupboards are 16 inches by 10 inches, with an inside depth of 10 inches. Deeper cupboards may be provided for by moving the columns an inch or so forward.

Oak is a very good wood to use for a fitment of this type, though chestnut, ash or birch could be used to advantage. Much may be done in the way of facing up. If the columns, plinth, doors, shaped front rail and shelf moulds are in solid hardwood, it is possible to use cheaper material for the less prominent parts. Camouflage should not be attempted if a real good article is desired.

Practically all the information required is included in the scale drawings shown. The cutting list is added for reference. The columns taper from 3 inches at the base to 1¾ inches at the top, being finished with a moulded cap, 6 inches square. The plinths should be solid but it may be found advantageous to build them up from ⅞-inch stock and with applied mould.

The shelves may be solid with moulded edge, notched to the columns, or as already suggested may be of some cheaper wood faced up with a mould. The doors are framed from 2 inch by ⅞ inch material, with neat moulding, and are hinged to narrow posts housed to the columns. This is clearly shown in the illustrations.

The treatment of the fireplace depends largely on the general scheme of the room. In the drawing a



Details of construction giving sizes

tile opening 3 ft. 3 inches is shown, with a moulded architrave and wood surround. This is a good arrangement for the average fireplace.

Cutting List

	Long ft.	Long ins.	Wide ins.	Thick ins.
2 plinths		10	8	5
2 front columns	5	2	3	3
2 column caps		6	6	1¼
2 back pilasters	5	9	3	1½
2 fireplace stiles	3	8	6	1
1 fireplace rail	3	6	6	1
Architrave mould	9	0	2	1½
2 blocks for ditto		6	2	1½
3 shelves	4	9	8½	¾
1 front shaped rail	4	6	2½	¾
1 end shaped rail		6	2½	¾
2 ends	1	8	5½	¾
2 end brackets		8	5½	¾
2 cupboard divisions		10½	7	¾
2 door posts		10½	1	⅞
4 door stiles		10	2	⅞
4 door rails	1	4	2	⅞
2 door panels	1	1	7	¼
Door mould	7	0	⅝	½
1 short shaped rail	1	7	2	½
1 back capping mould	5	4	4	1½
Material for back	24	0	4	½
Top back framing	15	0	1¾	¾
6 top back panels		9	8	¼

The ends are treated as shown in end view. The ends proper are shown with a heart-shaped opening at the side of the open shelf. Small brackets are used above the top shef while a small shaped rail is fitted below the lower open shelf. The back pilasters (13 inches wide) rise from the plinths. The top back is finished with a mould, which may be grooved to hold plates. The upper back is shown neatly panelled without mould. The lower back behind, the cupboard and open shelf, may aso be framed up if desired, but is shown plain here.

The list is for mantel as shown. Lengths quoted allow for joints but thicknesses are net.—The Woodworker, London, Eng.

Southern Pine and Douglas Fir Compared

There is little difference between the strength of the southern pines and that of Douglas fir from the Pacific Northwest, tests made at the United States Forest Products Laboratory show. True longleaf yellow pine averages heavier, stronger, and tougher than Douglas fir. True shortleaf pine averages heavier and tougher than the fir, but is about equal to it i strength as a beam or post. Loblolly pine, though averaging heavier than the fir, is somewhat weaker. The difference in strength between any of these pines and Douglas fir, however, is not so great but that low density pieces of the one species are weaker than the average for the other species.

As far as strength properties are concerned, the choice between any two lots of southern pine and Douglas fir will depend upon the grade and density of the timber composing each lot. The Rocky Mountain type of Douglas fir averages considerably weaker than the Pacific Coast type.

Attractive Furniture From B.C. Maple

Vancouver Company Breaks Into New Field—Exploits Native Hardwood Heretofore Not Used in Commercial Manufacturing—Importing Oak Logs from Siberia

By Our Vancouver Correspondent

Seeing is believing, therefore the correspondent of the Canadian Woodworker and Furniture Manufacturers' is in a position to acknowledge unreserved belief in the radical advancement in furniture manufacture achieved this year by the Restmore Manufacturing Company, Ltd., of Vancouver. This progressive concern is now making all forms of high class furniture in their Vancouver factory. But the greatest step in the new departure is that they are making it of hardwood and of hardwood from timber found in the wooded hills of B.C.

Extension table in B. C. maple, from the line of the Restmore Mfg. Co., Limited, Vancouver, B. C.

Every one at all posted in the industry in this province has been familiar with the many efforts that have been made in the past to utilize Douglas fir for making furniture. That splendid timber is still used and long will be, for some articles of furniture. But it has often been the expressed regret that there was no hardwood in this province of timber, from which suitable furniture material could be obtained. Mr. Barber, the founder of the Restmore Company, and the man who put the "rest" in the Restmore mattress, though he never rests himself, must get the credit for finding hardwood timber in British Columbia, suitable for the highest class of furniture work, finding it in sufficient quantities to warrant the expansion of their factory to establish a permanent manufacture of the sort, and also for getting the timber right from the woods to the factory.

Hardwood From B. C. Logs.

What is mighty interesting also, is to visit the big plant in the east end of Vancouver and see the rough logs unloaded from Canadian National Railway cars on the factory siding, then to see the logs cut into boards of varying thickness suitable for the different parts of the furniture into which it is to be made. That little saw-mill, tucked away in the corner of the big yard at the back of the Restmore plant, is a novelty in that it was delivered, assembled and put in running order and started cutting lumber in eight days after it was bought. Some time last spring the company found that they could secure sufficient hardwood logs to meet all the requirements of a large factory for years to come. They had been looking into the matter for years, and Mr. Barber had spent much time in the woods looking for the timber. The result was that a small logging camp was put in on Mount Cheam, in the Fraser Valley, about 90 miles from Vancouver, and soon logs were being sent in by rail to the factory. It was decided that the best policy was to cut the logs into lumber on their own premises and the small portable mills now in use was put in. It is doing the work efficiently and is also very useful for cutting up spruce and fir for secondary material and cedar and alder for crating and other purposes. That little mill is the only one in British Columbia put in to cut hard wood from B. C. timber. It has been operating for several months now, and the company expects to keep it going steadily, as they can get the timber, though it is somewhat scattered.

This is the first time that a serious and successful effort has been made to turn the broad-leaf maple of the coast districts to commercial account. It is the only one of several varieties of the "Acer" family, found in this province, which is large enough for any such purpose. The logs being brought in by the Restmore Company are from sixteen to twenty feet long and the largest is possibly not more than 24 inches in diameter. These logs are also as a rule somewhat rough, and not easy to handle. But, as Mr. Barber says, the rougher they are the better effects in grain they can get, which is an advantage in making furniture. Since beginning work the company has gone ahead steadily with perfecting all the steps in the familiar process of taking rough timber and turning it into finished pieces of furniture fit to grace the drawing rooms, dining rooms and sleeping chambers of the finest homes in the land. Every step is carried right through from the log to the shipping room. Three dry-kilns, built of hollow tile brick, are used to season the timber, and ample storage space is provided, all under cover, to take care of a large stock of the wood ready for making up. When the reconstruction plans of the company, now being carried out, are complete, there will be a battery of five dry-kilns to take care of the green timber as it comes from the saw.

Furniture in Oak and Maple.

In the factory there are machines installed with ample capacity for turning the rough lumber into finished shape, and cutting the various standard parts for every article of furniture. These are cut and stacked up by the thousand, ready for the next process in the assembling rooms, where a band of skilled cabinet-makers are always at work. From there the articles in the rough are passed on to finishing rooms, where the surface is smoothed and made ready for the

final stages of the art of furniture making, that of receiving the coats of stain and varnish and the careful polishing and buffing which turns them out a delight to look on and a credit to the makers.

With very trifling exception the company is now devoting its furniture factory to high-class hardwood furniture, and giving up almost entirely making any articles from Douglas fir. For some time the company has been making a line of oak furniture, and to a limited extent this is still being done. Very shortly, however, the intention is to branch out into oak on a larger scale. This will meet the demand that always exists for furniture of that wood. But to secure the raw material the Restmore Company is going far afield. They have about concluded their arrangements to import Siberian oak in the log, to be cut into suitable dimensions and specifications in their own mill. With the many lines of freight steamers, particularly the Canadian Government Merchant Marine, operating direct to the Orient from B. C. ports, it is a simple matter to bring in this timber, and the expectation is that with lowered ocean freight rates and the heavy increase in rail rates, a great economy can be effected. With the supply of local maple referred to above, and with the oak from Siberia the Restmore Company is making all its plans to specialize in hard wood.

While a very large line of its bedroom suites is still being made in the popular ivory enamel finish, stained and polished suites in a variety of effects are also being made. In dining room furniture a splendid choice of styles and finishes is being made, while in fine drawing room pieces the company is continuing its heavy upholstered manufacture, the facilities of its big mattress plant being invaluable for turning out the high class stock they make. In occasional pieces, such as small parlor tables, writing desks, hall chairs, etc., the maple wood is being used in a variety of finishes. Having made the big advance into the field of hardwood furniture, the aim now is to make a complete line of house furnishing which will carry the well-known name of Restmore, long a household word in the west for mattresses, springs and iron and steel beds.

Ambitious Plans of Successful Concern.

With a site 210 feet frontage by almost 800 feet in depth, and railway sidings and trackage privileges adjoining the Great Northern terminals, the Restmore Manufacturing Company is in splendid position for the expansion it now has in hand. When present plans are completed the front of the big plant will have a fine brick warehouse and shipping department extending across the full 210 foot front, and 75 feet in depth. This will be three stories in height, and will also contain the business offices. The present factory will then have much larger floor space, and will be re-arranged so that light railway tracks will extend right through from the sawmill at the rear, to the dry-kilns and through them to the storage and factory space, providing the utmost facilities for handling the raw material. The factory space will be further increased by removing the excelsior mill from its present location to a new building to be erected at the other side of the company's trackage. To take care of the fuel made from the saw and planing machines a storage house of large capacity and fire-proof construction is to be erected over the boiler house, so that all waste will be used for fuel.

Some idea of the capacity of the woodworking plant for turning out high-class furniture may be gained from a partial list of the machines and equipment installed, and which are being added to from time to time. In the finishing department there are two automatic sprayers of the Aero system, manufactured by the De Vilbiss Manufacturing Co., Toledo, Ohio. Two of the Rockford Tool Company's rubbers are also included in the department. In the woodworking department are a 4-sided moulder by Cowan & Co., a rip-saw with adjustable table, a self-feed rip saw, and a pony planer, all by the same company. A jointer made by the Canada Machinery Corporation, also an 8-inch 4-head sticker, a radial boring machine, a 12-spindle dovetail machine and four sanders, one of them a double end drum type, by the same concern are other machines in use. Some of the MacGregor, Gourlay Co., Ltd., machines used by the Restmore Company, are a tenon machine, a large surfacer, a 10-inch back knife lather, a 12-inch jointer and a dado saw. A sander by the P. B. Yates Company and one by the Hespeler Machinery Co., are in addition to those supplied by the Canada Machinery Corporation. Other important machines in use are a glue-jointer made by the P. B. Yates Machinery Company, an 8-inch Clement jointer by the American Woodworking Machinery Co., a No. 1 Variety saw bench by the latter company, a 6-spindle mortiser made by Wysong & Miles Co., Greensboro, Mass., a dowel machine by W. S. Hawker & Co., Dayton, Ohio, a double cut-off saw by the Beach Manufacturing Co., of Montrose, Pa., and a veneer trimmer by Brown, Boggs Co., Ltd., Hamilton. Very extensive increases in plant and equipment are contemplated in the plans now under way for completing the Restmore plant.

Starting in 1905 as a mattress making plant, the company was then known as the Barber Mattress Manufacturing Company. Putting the trade-mark "Restmore" to the front with such success, the company adopted the name later on. It has for years been making bed springs and iron and steel beds for a large trade, and its plant in those two departments is as extensive and complete as that just referred to in its furniture factory. In all some 160 employees are steadily at work, and a staff of salesmen are constantly covering Western Canada putting Restmore products in every town and city and camp over an ever-extending territory. The founder of the company, Mr. F. K. Barber, is the president and general manager; Mr. J. E. W. Thompson is vice-president and sales manager; Mr. R. Hunter is secretary-treasurer.

To Estimate Flooring

To determine the amount of flooring required for a certain space, figure the number of square feet in that space.—that is, multiply the length by the breadth of the room. Add to the square feet of surface to be covered the following percentages, which will give you the number of board feet of flooring required:

50% for	....	13/16 inch x 1½ inch
37½% for	....	13/16 inch x 2 inches
33 ⅓% for	....	13/16 inch x 2¼ inches
50% for	....	⅝ inch x 1½ inches
33⅓% for	....	⅝ inch x 2¼ inches
33⅓% for	....	⅜ inch x 1½ inches
25% for	....	⅜ inch x 2 inches
25% for	....	5/16 inch x 2 inches

If the room to be floored has bay windows, alcove, or other "offsets," allowance must be made, of course, for the additional floor area.

Can You Dry Red Gum Successfully?

Requires Special Treatment—When Properly Treated is Very Satisfactory Wood—Special Attention to Piling and Manipulation of Kilns

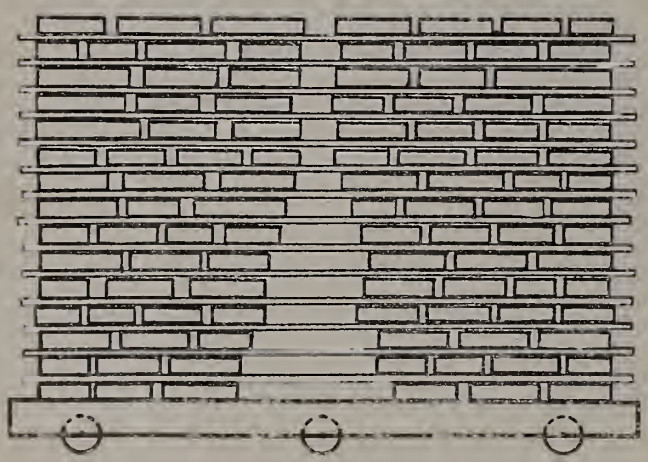
By H. A. Rolphe

Red gum is considered by many wood-users to be a very refractory wood, one that tends to give a considerable amount of trouble, both during seasoning, through subsequent manfacturing operations and even in the finished product. This reputation is not deserved, for with proper seasoning and intelligent care in kiln-drying, satisfactory results can and are being secured. With warping and checking reduced to a minimum, if not eliminated, the inherent good qualities of this lumber are such as to commend red rum to all woodworkers.

Satisfactory results can be readily secured by proper care and treatment in the dry kiln. Gum has little peculiarities of its own which must be studied, understood and treated accordingly. Once properly dried, and kept dry, the tendency to warp, twist and check disappears. It is then that the real advantages of this wood make themselves known.

Piling Requires Extreme Care

Perhaps the most important factor in the seasoning and kiln-drying of gum is the piling. This lumber



Piling with "Chimney" to increase circulation through pile.

must be piled carefully so that it will not only remain straight while on the stocks and in the kiln, but so that it will be held straight and all tendency to warp and twist resisted. To this end the stickers should be carefully placed one above the other, so that each sticker has an even, solid bearing on the one beneath it. It is also advisable to use more stickers than would be the case were other lumber being dried; say a cross stick every two feet with one as near each end as the kiln trucks will permit. It is also advisable to separate the lengths and pile each length by itself. This avoids all overhanging ends—a sure cause of warped boards—and in addition is advantageous because it enables a greater number of loaded trucks to be placed in a kiln. The better way is to have the lumber sorted into lengths as it is unloaded from the railway car.

One large manufacturer after experimenting with piling the lumber on the trucks with a "chimney" in the center, has adapted this method as a regular practice. He found that the lumber dried more evenly and quickly and that the savings thus effected more than offset the additional time required to stack the lumber. Piling in this manner improves the circulation in center of the pile.

Steaming to Relieve Stresses

After piling, the steaming next commands attention. Each dry kiln operator seems to have his own ideas about steaming. Some will steam 4/4 gum for forty-eight hours at a temperature of 110 and humidity at dew point, while other operators will carry 130 degrees of heat for a shorter period. Sometimes a temperature as high as 200 degrees or even 210 degrees is used. Even with 100 per cent. humidity this practice seems to be nearing the danger mark. Exceptionally good results have been secured by steaming from 12 to 18 hours at 150 degrees. Some carry 150 degrees for six hours. When carrying high temperatures, the humidity in the kiln must be watched carefully for should it be allowed to drop, the high heat will probably injure the stock.

After the initial steaming period the humidity, and, if necessary, the temperature should be gradually lowered, in accordance with the drying schedule to be followed. All changes in temperature or humidity should be made slowly and gradually. A drop or rise in temperature of 10 degrees or a drop of 5 points in humidity require at least five hours to make the change. A quick increase in temperature or a sudden drop in humidity is bound to have an injurious effect on the stock being treated.

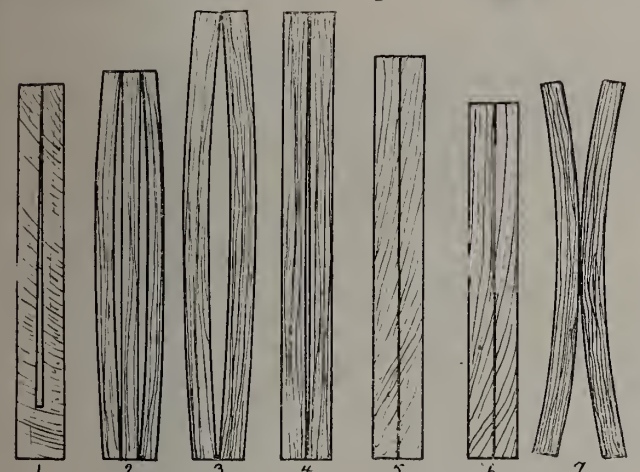
It is hard to lay down a hard and fast drying schedule. The kiln, the operator and the grade and condition of the lumber are all governing factors. One point to observe is that the higher the temperature carried, the higher should be the humidity. As the temperature and humidity that a given lot of lumber will stand without injury depends largely on its moisture content and to a lesser degree on whether or not it is casehardened, the condition of the lumber should be known, not only when the load is placed in the kiln but all through the drying operation. With this knowledge the operator, if he knows his business, is in a position to push the drying operation as fast as possible without risking the lumber. He also knows the exact moment the desired moisture content is reached and thus the drying is not prolonged any longer than necessary.

Tentative Drying Formula

During the run a very close watch must be kept to guard against checking and casehardening. At the first indication of checks the humidity should be raised. It is better, however, to guard against checking rather than strive to prevent its development after a tendency to check is observed. If frequent tests are made moisture content and the surface and core of the sample tested separately, the difference between the moisture content in the center and that

of the surface wood will give a good indication of the way the stock is drying and the likelihood of checks occurring. A few experiments, together with a little observation will soon demonstrate the variation that is permissable. The same applies to casehardening, as too great a difference would indicate that casehardening is occurring. Then there is the resawing test for detecting casehardening. In this, the shape assumed by the prongs of the sample resawed, give an indication of the amount of stress between center and surface.

The following schedule has been worked out by the Forest Products Laboratory at Madison, Wis., for the drying of air-seasoned red gum. Lumber having



No. 1 was not steamed at all. Notice the pinching together in the saw kerf.

Nos. 2 and 3 were not steamed sufficiently long to remove the casehardening. 18 minutes final steaming.

Nos. 4 and 5 and 6 were so steamed that stresses were removed. Such lumber does not warp. 36 minutes final steaming.

No. 7 was over-steamed showing a reversal of stresses. Steamed for 3 hours.

a moisture content of 19 per cent. or less is classed as air-dried, while above 18 per cent. it is considered green, and the formula changed accordingly.

As all the changes in both temperature and relative humidity should be governed entirely by the condition of the stock, the time periods given are only tentative and should not be followed rigidly.

Tentative drying schedule for air seasoned red gum:

	Temp.	Per cent. Humidity
After steaming	135°	85
" 12 hours' drying	140°	75
" 24 " "	145°	60
" 36 " "	150°	50
" 48 " "	155°	45
" 60 " "	160°	40
" 72 " "	160°	40
" 84 " "	160°	35
" 96 " "	160°	30
" 108 " "	160°	30
" 120 " "	165°	25
Until dry	165°	25

For ten hours after moisture content has reached 5%—165° with 80% humidity.

Overcoming Casehardening and Checking

If the stock checks or casehardens during the run, the humidity should be raised slightly, or if the signs indicate severe injury resort might be made to steaming. Some manufacturers make a practice of steaming at the end of the run and thus relieve all stresses and strains that may have been set up during the drying operation. This steaming is usually done just before the final percentage of moisture content has been reached. Final steaming should not be carried on at a temperature more than 10 degrees higher than the final drying temperature. The length of such steaming period is important. If carried on too long, what is known as "reverse casehardening" is often set up. It is better to steam for several short periods than to overdo it. The accompanying sketch shows the result secured by steaming for various periods. Some make a practice of simply increasing the humidity for the last few hours as indicated in accompanying formula.

The red gum department of the American Hardwood Manufacturers advocate, in their book on red gum, that the gum lumber be taken from the kiln trucks while hot and piled in a solid pile and allowed to remain this way for about 10 days. Whether this is advisable or not the writer is not prepared to say, but it seems to be at variance with the usual kiln drying practice.

National Council Hold Annual Meeting

The second annual meeting of the National Council of Furniture Associations was held at the Washington Hotel, Washington, D.C., on December 8 and 9.

The meeting was notable for its serious deliberation and complete harmony. The great question for consideration was, of course, the present slump in business and ways and means to start the wheels to turning.

Stable and permanent selling values seemed to be the most needed thing to encourage sales both on the part of the manufacturer and the retailer. The impossibility of further reductions under present conditions of labor and materials was apparent to all. In fact, there seemed to be a feeling on the part of some that there might be at least a temporary advance in some raw materials such as hardwood lumber, owing to small stocks in the hands of lumbermen and the possibility of a sudden demand.

With labor and materials at the bottom point for some time to come, there seemed to be no reason for uncertain costs except as to fluctuation of overhead on small or large output. It seemed possible, therefore, for furniture manufacturers to issue new price lists, based on replacement costs, which would have a great degree of permanance through the furniture markets in January and the spring season. With the strong manufacturers taking this attitude and action, the vascillating and weak-kneed brother would be encouraged to save his own neck by not resorting to ruinous prices to force business.

In accordance with this feeling, the unanimous views of the council were expressed in the following recommendation to member associations:

1. That manufacturers of furniture establish at once values based upon replacement costs, including a fair consideration for labor.

2. That such values be established as permanent values for the spring season of 1921.

3. That if any guarantee be deemed advisable that said guarantee be to the effect that any change in price during the spring season of 1921 be retroactive 60 days prior to the date of such change.

These recommendations having been concurred in by representatives of the Retail Furniture Association of the United States, it is the opinion of the National Council that general adherence to same will have a strong tendency to stabilize the January markets and promote sales.

The council went on record as favoring the open shop which is in line with the general movement in manufacturing fields in this country.

Defects Ordinarily Found in Lumber

The large number of defects found in lumber and the many grades which now are on the market make lumber grading exceedingly complicated. Only a person thoroughly familiar with wood and with long experience in handling lumber can expect to pass on the grade of any particular lot satisfactorily. The layman, however, can readily comprehend the theory of grading if he is willing to study the subject.

The accompanying photograph of a panel prepared at the Forest Products Laboratory shows some of the more common defects recognized as such commercially. The kind, size, number, and location of defects, as well as the size of the board, determine the grade of lumber.

Knots are classified not only as to their size, but also as to their condition, such as sound, rotten, tight, and encased. Lumbermen's associations differ in their definition of an encased knot, but they agree in general that it is one not completely intergrown with the surrounding wood.

The seriousness of shakes and checks depends upon their length and whether they go clear through the lumber.

Pitch pockets, which are an accumulation of resin in lens shaped openings, are classified with respect to their length and width. On the other hand, pitch streaks, which are an accumulation of pitch within the fibers, are classified with respect to their length and width as compared with the length and width of the board they are in.

Clear sapwood is not considered a defect in many of the higher grades, and stained sap is not classed as a defect in the lower grades.

The holes made by sap suckers and wood-peckers often depreciate the quality of wood. The discoloration produced above and below the peck is usually more of a defect than the hole itself.

Decay is a serious defect and is not permitted in any but the lower grades of lumber.

Wane, which is the presence of bark or the absence of a square edge for any reason, will lower the grade of clear lumber, but it can be trimmed off without much loss. In the New England states much lumber is not edged at the sawmills, and the edges are trimmed square with the faces of the boards when the lumber is worked up.

Because of the presence of defects in logs a great deal of low grade lumber is produced and as our virgin forests become more and more depleted, closer utilization of top, second growth, and defective trees will increase the proportion of low grades. These must necessarily sell at a comparatively low price, and for many purposes are entirely satisfactory. In many instances the more serious defects can be cut out, and the lumber used for high grade work.

Walnut Manufacturers for Open Shop

At the November meeting of the American Walnut Manufacturers' Association in Chicago, the members present unanimously adopted the following resolution:—

"Resolved, by the members of the American Walnut Manufacturers' Association, here assembled, that it is the sense of this meeting that the principle of the open shop be commended and approved; and that the moral suport of this association in all its relations should be freely given to any and all members of the association or to any committee which are seeking to put into actual effect the practice and principle of the open shop."

Since its adoption the resolution has been submitted to members who were not present at the meeting, with the result that its adoption has been approved by every member of the association.

Pioneer Furniture Manufacturer Passes

In the death of J. W. Kilgour, which occurred recently at his home in Beauharnois, P.Q., the firm of J. W. Kilgour & Bros., Limited, Beauharnois, loses its esteemed president and the furniture industry one of its oldest active members, for he has been actively

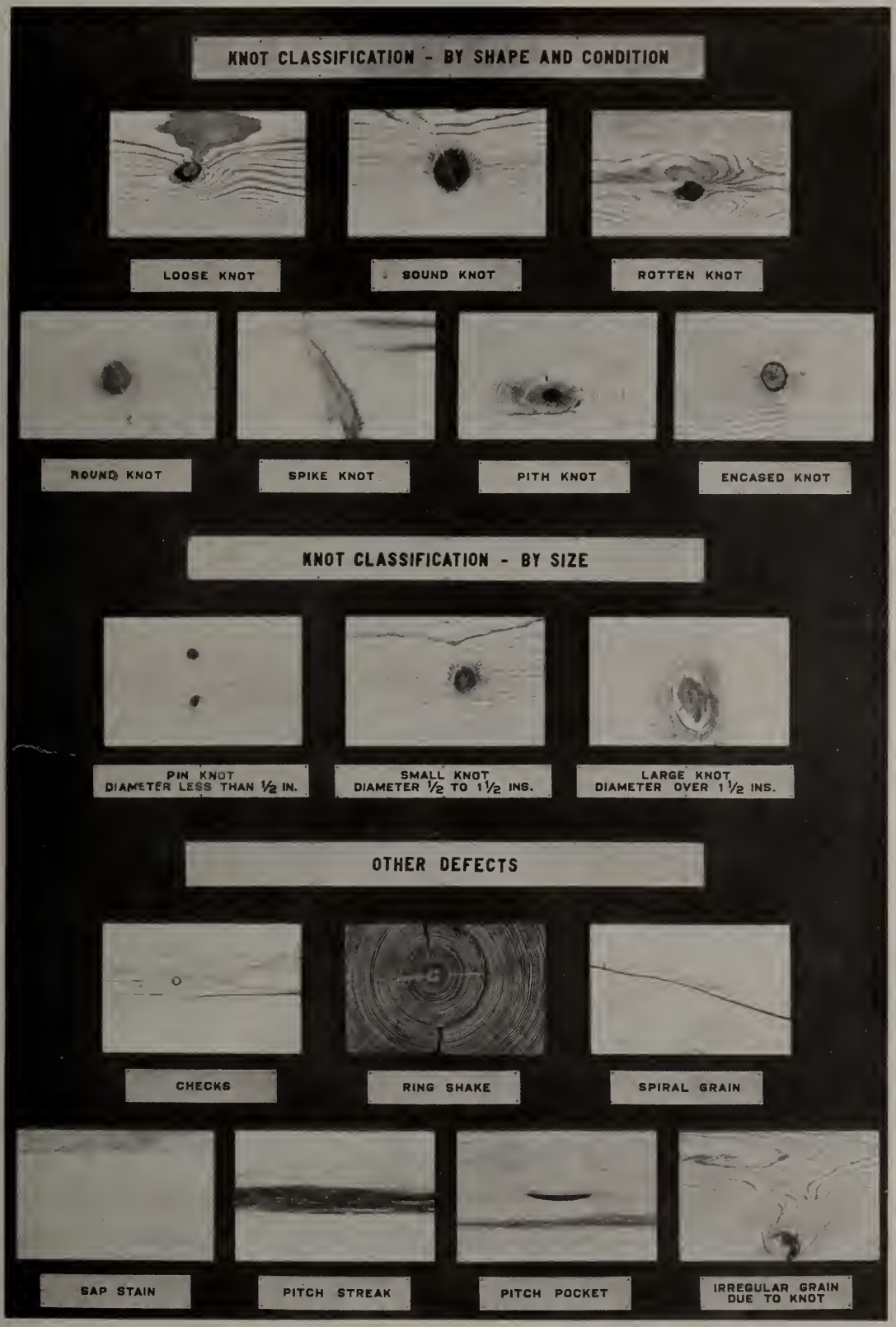
The late J. W Kilgour.

connected with the manufacture of furniture since 1863—a matter of 58 years. Mr. Kilgour was born in Beauharnois in 1843 and at the age of 15 entered his father's cabinet shop, where he served his apprenticeship. In 1863 he opened up a small shop of his own, taking his brother into partnership a few years later. A steam plant was installed about 1870. The present organization, J. W. Kilgour & Bros., Limited, was incorporated in 1910, with Mr. Kilgour as president. Thus he lived to see his business grow from a very small beginning to what is one of the largest furniture manufacturing industries in the province of Quebec.

The heartfelt sympathy of his many friends in the industry will go out to his bereaved relatives and business associates.

Lumber for Sewing Machines

About 60 million feet of lumber are used annually in the manufacture of sewing machines. Oak and red gum each supply nearly one-third of this lumber, and yellow poplar and black walnut each a little more than one-eighth, the balance being made up of tupelo, chestnut, cottonwood, maple, basswood, birch, sycamore, mahogany, yellow pine and redwood. Tops of sewing machines are usually made of hardwood veneers such as oak or walnut, or of other woods stained to imitate mahogany.



Defects Found in Commercial Timbers

Courtesy Chicago Mill & Lumber Co., Chicago, Ill.

Woodworkers who Won Honors in Civic Arena

K. J. Shirton, Wm. Shirton & Co., Limited, Dunnville, Ont.

Jas. E. Gardiner, P. W. Gardiner & Son, Galt, Ont.

J. A. Laberge, Laberge Lumber Co., Limited, Sudbury, Ont.

Dunnville Honors Woodworker

K. J. Shirton, of the Wm. Shirton Co., Limited, who operates a large planing mill and woodworking plant at Dunnville, Ont., was recently elected mayor of Dunnville for 1921. Mr. Shirton is one of the live, aggressive business men of that town and has given considerable attention to public affairs. In recent years he has served in the following capacities: As member of the Board of Education, as councillor, on the Public Utilities Commission, and as president of the Board of Trade.

Woodworker Wins Civic Honors

James E. Gardiner, junior member of the firm of P. W. Gardiner & Son, Galt, general woodworkers, sash, doors, etc., was elected an alderman of that city at the recent municipal contest. Alderman Gardiner had the honor of heading the polls with a substantial majority over his next competitor. This is his first experience in public life. Mr. Gardiner is well-known in the woodworking field having travelled for years throughout Ontario and the Maritime Provinces in the interests of the firm.

Wins Honors in Civic Arena

J. A. Laberge, Laberge Lumber Co., Limited, Sudbury, Ont., who conducts a large woodworking operation in connection with their lumber business, was recently returned by acclamation, as mayor of that city. This will be his second term in office and is a mark of appreciation for the valuable service rendered during 1920. Mr. Laberge is only 28 years of age and has the distinction of being the youngest man who ever held the position of chief magistrate of Sudbury.

Optimism Keynote of Convention

Optimism was the keynote at the convention of the Canadian sales force of the Internationtl Business Machines Company, held at the offices of the Company, Royce and Campbell Avenues, Toronto in the week of January 3rd, 1921. About 75 salesmen were in attendance, the three well-known divisions of the Company—International Time Recorders, Internation Dayton Scales and International Tabulating and Sorting Machines.

Assembling just after the close of a record business year, the members of the sales force voiced a justifiable pride in the achievement of 1920. That even this excellent showing, would be eclipsed during the present year was the confident prediction of the salesmen present, based on observation of the prospects in their respective fields.

"A fifty per cent increase in business in 1921" is the task to which they have addressed themselves and not a few expressed the conviction that even this mark would be passed long before the close of the year.

Figures presented at the convention showed that the sales forces of the American firms manufacturing similar products. In fact, the Canadian organization has led the entire world in sales, on percentage of quota, for four successive years. The Canadian boys, naturally felt elated, and justifiably so, in view of the fact that the sales forces in the United States and England number some 1100 men, and that all quotas are based on the same figures, namely, of publication.

F. E. Mutton, Vice-President and General Manager, of the International Business Machines Co., Limited, is proud of his sales forces and advises that not only he, but the entire sales organization never were more optimistic as to the future.

If a heavy machine fails to maintain production due to slippage of a single-ply belt, replacing the belt with a double-ply one often overcomes the trouble.

A saw driven by a belt, which is too light or too narrow, cannot be expected to give satisfaction. The saw itself is not to blame.

Acquire Cooperage Plant in Stratford

As announced in the December "Canadian Woodworker," the Manufacturers' Lumber Co., Limited, Stratford, Ont., have acquired the cooperage plant in Stratford, formerly operated by Merritt & Co., of Chatham, Ont. Hoops, staves and hardwood lumber will go to make up the output of this plant. In addition to the cooperage plant, a sawmill, with a capacity of 1,500 feet per day, is operated at Shakespeare, Ont.

J. A. McFadgen, the founder of the company, taught school for several years previous to embarking in the lumber line. It was while principal of a public school in Stratford that he came in contact with the late Mr. George McLagan, who was then a member of the Board of Education. A close friendship was formed between Mr. McFadgen and Mr. McLagan. In 1903 when this progressive furniture company, which used principally domestic woods, ran short of stock, buyers were sent out in all directions, in order that as large a supply as possible might be secured. Mr. McFadgen undertook to do some exploring for the company. Born and brought up in Wellington County, he had a fairly good idea of trees, their properties, uses, growth, etc. He then learned the grading of lumber by spending every spare hour of his time down at the McLagan factory watching the break-out saw.

Two years after Mr. McFadgen started the Manufacturers' Lumber Co., he was joined by his brother, the late W. A. McFadgen, and in 1907 another brother, G. A., came into the company, and was followed three years later by C. A. The latter two now do the buying grading and shipping, while J. A. gives his personal attention to the executive and selling ends, and also supervises a portion of the buying.

When asked how the name "Manufacturers' Lumber Co." happened to be selected, Mr. McFadgen said it was because their special business was to buy from the manufacturer and sell direct to the factories. There was thus only the one profit and the one handling. By reason of this, better service could be given and a more thorough and intimate connection developed. A nice business has been worked up with furniture and implement factories and manufacturers of hardwood trim.

Breaking-in New Saw Blade

New saws should be carefully and slowly put to work, gradually increasing the time allowed to run on the mill until the saw gets into a set condition.

First place the saw on the wheels with the teeth well clear of the edge of the wheel; strain or tighten the saw over the wheels, noting that the amount of weight or strain is correct for the width and gauge of the saw. Tilt the loose or driven wheel by means of the handwheel, if necessary, to place and keep the saw in a position on the wheels—that is to say, about 1 in. to 1½ in. overhung from the edge of the wheels carrying the saw. Then run the mill for at least 15 minutes without cutting.

Now take the saw off and place it on the levelling plate, test it with the level for lumps and twist. Correct in each case any part of the saw that requires it, unless a loose place be found.

Do not attempt to adjust the latter, if it exists, as it will pull tight after the saw has been run on the mill a few times. Once again place the saw on the wheels, and run as before; again take it off, place it on the bench and look it over, correcting where found necessary. The next time the saw goes on run it at a slow feed rate for 15 to 20 minutes, when again it should be carefully examined, finally sharpened, swaged and shaped.

As the tendency of a new saw is to run fast or tight under the tooth, test carefully and thoroughly for this fault. If the tension gauge is used on half the width of the saw, i.e., from the center to the front, it will readily show if this condition of being fast under the tooth exists.

G. A. McFadgen, Vice-President, Stratford, Ont.

J. A. Fadgen, President Stratford, Ont.

C. A. McFadgen, Director Stratford, Ont.

Men behind Manufacturers Lumber Co., who recently acquired cooperage plant in Stratford, Ont.

Heavy Ends, Light Sides, Make Strong Boxes

Balanced Construction of Wooden Boxes—Comparative Strength of Boxes of Heavy and Light Material—Holding Power of Nail Governing Factor—Value of Strapping

By T. C. Sims*

A little observation of box failures is sufficient for anyone to determine that failures are usually due to the box opening up at the corners. Seldom are the boards themselves broken. If the nails hold, or, in other words, if the joints at the corners hold together, the box is most likely to stand up and deliver the goods. Very thin lumber will often carry the most surprising weights if the box in which it is used is so constructed that the joints hold together.

The chart reproduced on the opposite page represents a series of tests made at the U.S. Forests Products Laboratory, at Madison, Wisconsin, on a box of standard dimensions for carrying boots and shoes: viz., 35¾ x 17⅛ x 13¾. The figures at the top of the different columns represent the number of falls, which the box being tested, received in the testing drum. This drum is 14 feet in diameter, with special hazards arranged on every one of the six sides. As the drum revolves, the box is carried up and falls on the special brass or metal points which form the hazards on the inside of the drum. In a great number of revolutions the box must fall in almost every conceivable position, cornerwise, sidewise, endwise, etc. The heavy horizontal lines in the chart indicate the number of falls reached by the various boxes and specifications tested.

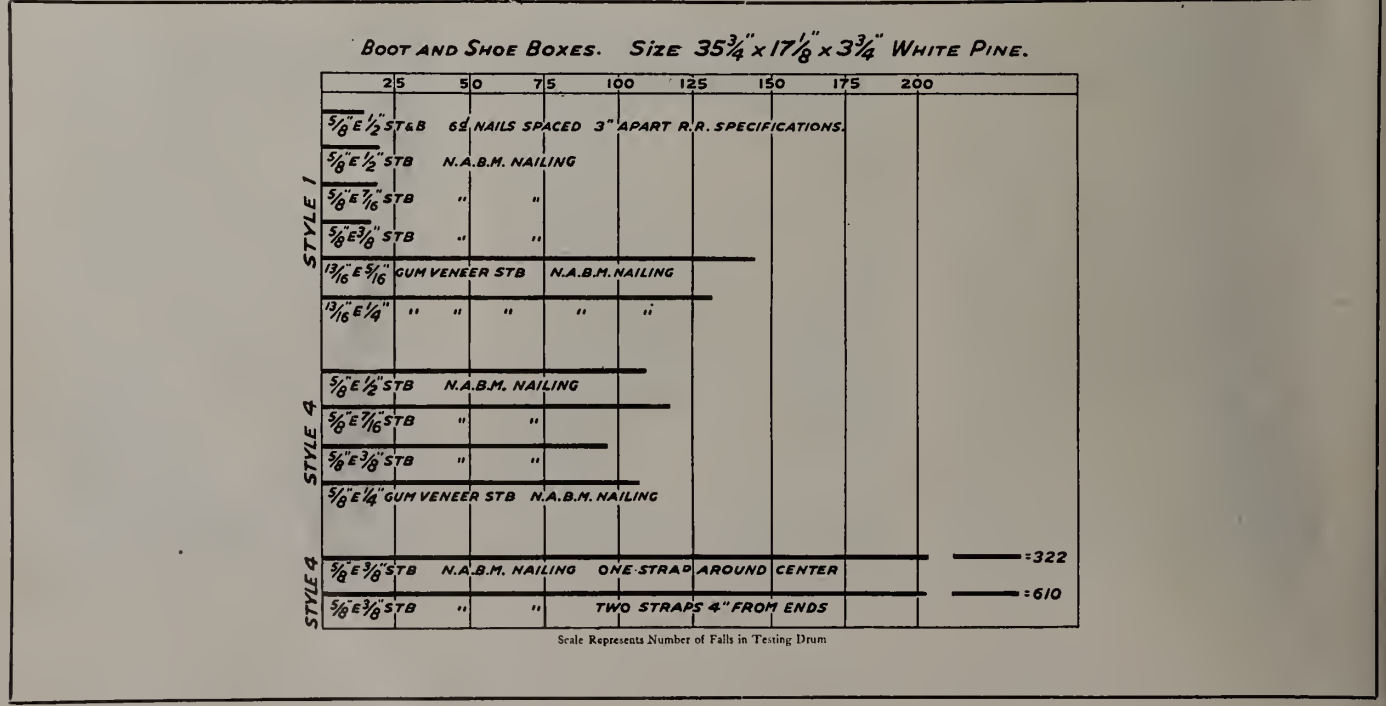
In the first test which was made with a style one nailed box, built of white pine, the black horizontal line indicates that the box failed to last for twenty-five falls. This box had ⅝" ends, ½" sides, top and bottom, and was nailed with 6d nails, spaced 3" apart. The nailing specifications used in this test were those given in the standard railroad specifications for boot and shoe boxes. The longest horizontal line indicates the box lasted through nearly one hundred and fifty falls.

It should be noted that in the boxes which reached the greatest number of falls, the sides, tops and bottoms were of much thinner material than the sides, tops and bottoms of the first box, but the ends were of heavier material. The nailing specifications of the National Association of Box Manufacturers were used, however, instead of the standard railroad specifications. The species of wood determines to a large extent the specifications used by the National Association of Box Manufacturers, and these species are placed in four groups, embracing practically all the woods commonly used in boxes.

The point seems worthy of emphasis that the failure of the box having the ⅝" ends was due to the splitting of the ends, with a consequent opening of the corners. The heavier end which did not split so easily, and which held nails a great deal better, made a box which was much more satisfactory, even to the point of permitting the use of much thinner sides, tops and bottoms. In the last test on the style one box, ¼" lumber in the sides, tops and bottoms, with 13/16" ends, lasted for more than one hundred and twenty-five falls. This could not be appreciated except from a comparison of the life of this box with the life of the first box which was built of ½" sides, tops and bottoms, or double the thickness, and which lasted considerably less than twenty-five falls.

It is doubtful if many shippers have thought of why it is ever necessary, in the use of principal types of wooden boxes, to construct the boxes of heavy lum-

*Chicago Mill & Lumber Co., Chicago, Ill.



ber. Heavy lumber holds nails better than thin lumber. The merits of heavy lumber is in the nail holding power more than in the stiffness or breaking strength of the boards. For instance, in the first series of tests it is shown that when the ends were increased in thickness from 5/8" to 13/16" that 1/2" sides, tops and bottoms could be reduced in thickness to 1/4". Rotary cut gum lumber, one piece stock, increased the strength of the box 100%, with a reduction of 42% in the amount of material used. But, there is little difference in the efficiency of the box built of 5/16" sides, top and bottom and a box built of 1/4" sides, top and bottom, where the ends are 13/16" in each.

The results of the tests on the style four box, where the same nailing specifications were used in all instances, fully emphasizes the comparative unimportance of the thickness of material. There was no appreciable difference between the security of the box with the 1/4" sides, top and bottom and the other with 1/2" sides, top and bottom, both having ends of the same thickness.

Too much emphasis cannot be placed on the importance of a strong end with its corresponding nail construction and the comparative unimportance of the thickness of the material in the sides, top and bottom. The practical application of this principle to your customers' needs will do more to insure satisfaction in service and effect greater economies in packing box costs than any other factor that has been developed in box construction since the introduction of rotary cut lumber and of fibre board boxes for carrying light weight commodities.

The last test shows the effect of strapping. The results as charted indicate that a very high value can be placed upon some form of strapping. One strap increased the strength about 200% while two straps increased the strength about 500%. The straps were applied without nailing, after the boxes are closed.

The Standardization of Canned Foods Cases

Tests to Determine Serviceability—Reducing Thickness of Stock to Minimum and Securing Balanced Construction—Lighter Box But Better Service

By Don L. Quinn*

(Continued from December issue)

The laboratory tests and study of the construction of canned foods cases, of which so much mention is made, were run under the joint supervision of the National Association of Box Manufacturers and the Forest Products Laboratory of the United States Department of Agriculture, with the active co-operation of the National Canners' Association, thereby combining technical and engineering skill with the experience of practical and leading box manufacturers, and of the users. The results obtained proved the wisdom of this sort of co-operation.

Three principal methods of tests were run in order to appraise properly the different effects of all the hazards of storage and transportation, and from this data to build boxes at a minimum of expense which would withstand all those hazards.

A box packed with filled cans was placed in a revolving drum machine, which had in it hazards so arranged that the box would fall in a more or less regular cycle on ends, sides, top, bottom, corners and edges, until its weakest part failed and the contents spilled. The weakest part may have resulted from too few nails or the wrong kind of nails, it may have been too thin ends, allowing the ends to split, or too thin boards in the sides, top or bottom, or from other weaknesses. Whatever it was, that weak part was made stronger, and the box was again subjected to the same kind of falls until another weak part failed, and the process then repeated. These tests also showed up the parts which were too strong compared to the average strength of the other parts, and these consequently were made less strong. As a final result, the weakest factors were strengthened, and the over strong factors were made less strong until all parts were equally strong on an average, and we had what we call a balanced box construction.

Comparative Strength of Boxes.

After this balanced construction was fixed for boxes made of the different species of woods, it became necessary to subject them to drop tests in order to compare one species of wood, when built into boxes, with the others. For instance, a birch box with 5/8 ends and 5/16 sides, top and bottom is so much stronger than a white pine box of the same construction, that it would withstand much harder falls. Since the white pine box was strong enough for the service required, it was necessary to know how much thinner the boards in the birch box could be, and still have as much strength as the white pine box.

These tests, combined with the many, many thousands of tests which had already been run in the Government Laboratory on the strength properties of the various species of woods, permitted the fixing of the proper relationship of thicknesses of lumber when used in boxes. That comparative relationship has since become a definite, fundamental standard of box construction.

These two tests were not in themselves sufficient, for boxes are subjected to other hazards besides falls. It was necessary to test the empty boxes in a compression machine in order to measure their strength when in a pile, or when stacked in a moving, swaying, jerking freight car. Unless the box had sufficient rigidity to stand up under the strains in a moving freight car, or to withstand high piling in a store room, the load would have to be carried by the cans themselves and the box would not be performing all its proper functions.

Rigidity and Strength Test.

In this compression test, the pressure was applied to one corner of the box, with the opposite corner diagonally through the box, in a direct line with the pressure exerted. Pressure was continued in an ever-increasing amount until the box broke up. The amount of pressure was measured in pounds, so that the number of pounds exerted before failure occurred, became the designated strength of that particular box.

These three principal tests—the drum test, the drop test and the compression test—were all necessary

to determine the entire serviceability of the box. Without all of them, no one could surely say that the box would be a satisfactory container for the purpose required.

Other tests were made to determine the holding power of cement coated nails, barbed nails, plain nails and the like, and to determine the number which should be used to balance the strength of the lumber. Tests were also made to determine the effect of moisture in weakening the general construction of boxes; the shrinkage and swelling of woods that result from moisture conditions and their effect on the nails holding the parts together.

All this, however, permitted us to say definitely to the transportation companies that boxes of the specifications proposed by us, for carrying canned foods, would give strength in service beyond that which such boxes now have, and if properly policed, would reduce loss and damage claims, under the ordinary hazards of transportation, to the minimum.

Better Service to Box Users.

To the manufacturer of boxes, we can safely say that regardless of the section from which he may draw his lumber, regardless of the type or kind of wooden box he manufactures, if he makes them according to these specifications, he will be conserving his timber resources to the best advantage. Moreover, he can take just pride in the service his boxes will give his customer. "He will profit most because he will be serving best."

To the canner, we can say: The thickest material required in any species of wood under these specifications is thinner than was tentatively agreed upon by the canners, the wholesale grocers and the railroads in Baltimore in February, 1914. The thickest material is required for Group I and II woods, which specifies 5/8 in. ends, and 5/16 in. sawed sides, top and bottom. These two groups carry species such as white pine, spruce, fir, cottonwood, southern yellow pine and hemlock, to name only a few. In red gum, sycamore and similar species of Group III woods, 1/2 in. ends with 5/16 resawed sides, tops and bottoms, or 1/4 in. red gum veneer are authorized. In the fourth group, which includes birch, beech, maple and the like, 1/2 in. ends and 1/4 in. resawed sides, tops and bottoms are specified. Cement coated nails are required for all boxes. Seven penny nails are specified for Group I woods, six penny for Group II woods and four penny for Group III and IV woods, because these are the largest nails which can be driven into the specified thicknesses without danger from splitting of the lumber. So you see, the allowable variations in thickness and the allowable variation in size of nails are in accordance with the known strength of the different species and their proper nail holding capabilities, and are the minimum thicknesses which have ever been used in these cases. Because of the allowable variation in thickness, canned foods cases to the canners as a whole will be lower in cost than they are now, and much lower than they would ever have been, had the tentative standard fixed at Baltimore been made permanent.

Responsibilities of Each.

With all these benefits—increased serviceability for the railroads, universal practicability for box manufacturers and greater average economy for the canner—there are responsibilities which each must carry. The transportation companies must properly police the containers, and ultimately translate reduced loss and damage claims into lower rates or else into better service. The box manufacturers, being permitted to cut their timber into minimum thicknesses, must eliminate defects, such as rot, dote, knots, knot holes, splits, shakes, etc., which materially affect the strength of the box, and must give his customers sound lumber, cut square and true to proportions. The canner must keep his boxes properly stored, must not nail them up long before they are needed in service, must not store them in a dry heated room after nailing, and above all must see that all nails are driven squarely into the wood flush with the surface, not overdrawn, nor in a crack.

By assuming these responsibilities the railroads, the box manufacturers and the canners will be keeping faith with those in the National Association of Box Manufacturers, National Canners' Association, National Wholesale Grocers' Association, and in the United States Forest Products Laboratory, who have worked so hard, so consistently and so long to secure these specifications which make for the cheapest, yet the best wooden boxes which can be used for carrying canned foods.

Wiring of Boxes for Export

The order of the steamship companies operating between Canadian ports and ports in the United Kingdom requiring that all apples in boxes for export be strapped or wired has been modified to the extent that wiring or strapping is no longer necessary provided the steamship companies are relieved of the responsibility by the shipper for loss or damage resulting from the absence of this device. A number of carloads having no straps or wires have gone forward, and in many cases have shown considerable breakake. A large portion of the shipments have not reached their final destination when discharged by the steamship companies at the sea ports, as large quantities are carried by the transportation companies to the various towns and cities in the United Kingdom, and the reports from these transportation companies show that heavy losses have resulted where boxes have not been wired. These losses in the last analysis are paid for by the shipper in Canada.

In the light of past experience, strapping or wiring apples in boxes for export is cheap insurance against loss and damage in transit and its continuance, notwithstanding in modification of the order, is strongly recommended.

Excellent Time to Make Repairs

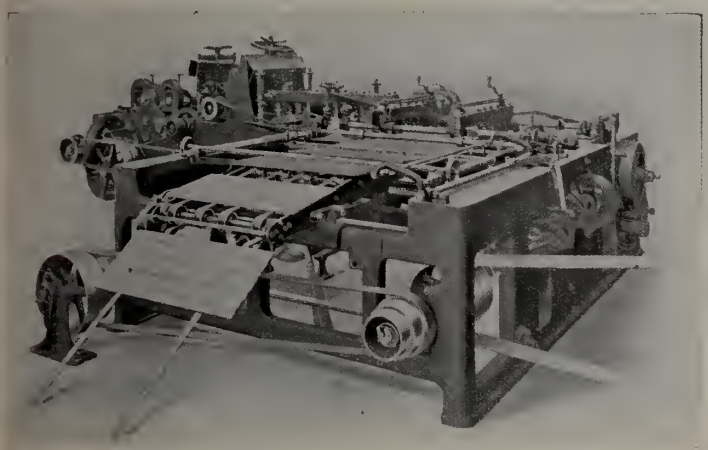
When things are quiet as they are to-day it is a very good time to get the mechanical equipment in the factory well oiled, where special parts are not working. This is a good "fixing time," because it is practically stopping the clocks and closing down the blinds and putting most institutions on a heavy overhead basis; therefore as the foreman and the engineer and the mechanical genius about the plant are on the payroll anyhow it is a pretty good time to see that the mechanical equipment is prepared for more aggressive action during 1921. We hope the employee will get his joints oiled up also and figure on helping to make the plant have a profitable year during 1921.

The value of sand-paper for a belt is determined by the quality of the glue and the cutting edge and life of the grit.

Machinery & Equipment

Automatic Box Board Machine

Boxmakers, no doubt, often wish for a piece of equipment which will take material of uneven widths, and lengths and joint, dress and size a complete box side, top or end in one operation. Such a machine is Bolinder's Automatic Box Machine No. 15 intended to take material, cut to rough length and edge, and to plane, tongue, joint and make up finished box sides and ends to exact dimensions required. The short boards are piled up in the feeding apparatus of the machine and are from here fed into the automatic machine, whereupon the boards, if necessary, are



Bolinders box board machine

planed on either end or both sides and furnished with tongue and groove. The edge is then glued, if so desired, and the boards are joined together. This jointed material is correctly adjusted to length and cut up into widths corresponding to the desired dimensions of the box sides or ends, etc.

For the operation of the machine only two men are required, one young man for feeding the boards into the machine and one for looking after the machine, its planing steel, cutters and saw-blades.

As already mentioned the finished box sides and end, etc., are completed entirely in this machine, without being adjusted or rehandled in any other machine. The maximum rate of feeding is 88 ft. per minute, which for an 8-hour working day using for instance 4 in. x ½ in. 24-inch lumber makes more than 3½ standards or about 7,000 pieces 24 in. x 12 in. finished box sides.

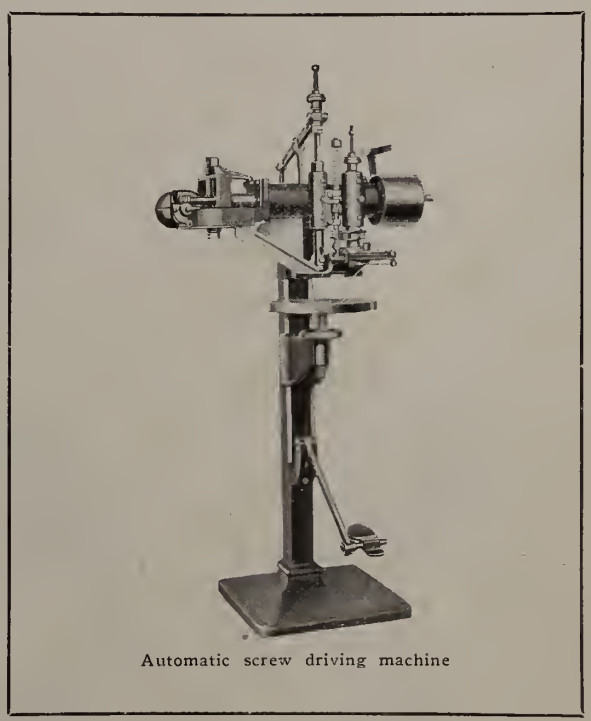
Using three cross-cut saws, double the number of finished sides will be obtained, in the present case for instance about 14,000 pieces 1 in. x 12 in. finished box sides.

Lumber is saved partly on account of the planes being cross-cut before being cut up into boards so that the ends can be used for the manufacture of small boxes, etc., and partly due to the fact that the boards are jointed in the machine, one after the other, without any loss in edging. Besides, there is a gain of about ⅛ of an inch in the width of each board on account of the slight depth of the dovetail joint.

Full particulars may be secured from the Swedish Steel & Importing Company, Montreal, who are the Canadian agents for Bolinders, Limited.

New Type Screw Driving Machine

Of all the tedious and exasperating jobs that occur in light assembling work, that of starting and driving short screws deservedly stands at the head of its class and any device that promises to depose this operation from its evil eminence is worthy of consideration. The Reynolds Machine Company of Massillon, Ohio, had this in view when designing the machine illustrated herewith which rapidly and easily sets screws as electrical binding screws, switch box screws, washer head screws, etc. The machine heretofore built by them have been very successful in automatically feeding and driving screws of ordinary proportions, but so far as is known, no machine up till now has ever been placed on the market to handle screws the length of which is less than the diameter of the head. While designed especially for short screws, this machine is not limited to such, but drives also screws of ordinary lengths and sizes of heads. In operation, screws are thrown at random into the magazine at the right of the machine. This magazine automatically arranges them in single file with heads upward and delivers them in this position into the inclined track shown leading from the magazine. Opposite and close to the lower

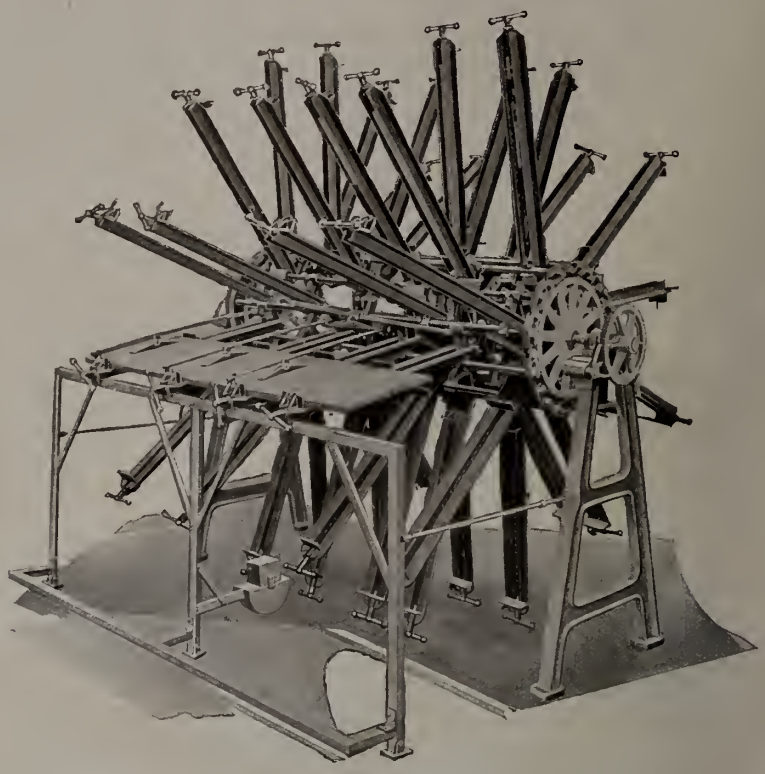


Automatic screw driving machine

end of the track is a finger recessed to receive one screw and hold it in line with the spindle.

The spindle, which carries a screw driver bit, is brought down by the foot lever, the bit engages slot in screw head and finger and screw are carried downward until the point of screw engages work, when the finger

New Yates swing saw.



Convenient small revolving clamp carrier.

is automatically withdrawn to allow the screw to be driven home.

The spindle is adjustably, frictionally driven so that screw driver bit stops when screws are driven as tight as desired, or screws can be merely started, or driven, to a uniform depth. Table is 12 inches in diameter and is adjustable on column to take work up to 15 inches high and has screw for close adjustment. Foot lever is pivoted well above the pedal to give an easy swinging position, and can be adjusted both for position and resistance to suit convenience of the operator. Operation of Machine with foot lever leaves both hands of operator free to handle or assemble work. Spindle may be run several hundred R.P.M., setting screws practically instantly. Machine is driven with tight and loose pulleys as shown, or with individual motor.

Small Revolving Clamp Carriers

A convenient type of small revolving clamp carrier is shown in the accompanying illustration. This machine has been but recently placed on the market by the James L. Taylor Manufacturing Co., Poughkeepsie, N. Y. It is designed to suit the requirements of those who have not sufficient work to warrant the installation of a larger unit or who are handicapped through a lack of space and lastly for those who find it advantageous to have several small clamps in different parts of the factory in preference to one large clamp in some central location. In genertl construction and detail, it is very similar to the clamp described on page 74 of the July, "Canadian Woodworker." It is made in two sizes; 8 or 12 sections. Each size can be secured to handle stock 6 1-2, 7 1-2 or 8 1-2 feet long, as desired, and with any number of clamps to a section. A handy end clamping attachment can be provided. The clamps are adjustable crosswise independently and are the same as those furnished with the larger units. These smaller carriers are in strong demand by piano manufacturers and others: in fact they were first designed at the express request of several piano men.

Full particulars may be had from the makers or from the A. R. Williams Machinery Co., Toronto. the Canadian representatives.

Self-Contained Swing Saw

The accompanying illustration shows a motor-driven swing cut-off saw, the product of the P. B. Yates Machine Co., Hamilton, Ont. The frame is a one-piece casting, braced and flanged to give strength and rigidity. The saw frame is pivoted at a point slightly below the line of the countershaft. This tends to eliminate vibration at the saw as well as tightening the belt as it enters the cut. The adjustable counterpoise ensures an easy return after the cut is completed. The saw is adjustable both vertically and horizontally and both saw and arbor pulley are efficiently guarded. This makes an efficient self-contained machine. It can be secured, in slightly modified form, for belt drive. The size of the motor depends on the diameter of the saw carried. A 14-inch saw requires a 3 h.p. motor; 18-inch saw, 5h.p. motor; 24-inch and 30-inch saws, 7½ h.p. Full particulars may be secured by writing the manufacturers.

Match Factory in Malay Peninsula

As there is a great demand in the Malay Peninsula and near-by countries for matches, the bulk of which is now supplied by Japan and China, the progress of the new match factory which is being erected at Kuala Lumpur will be watched with interest. The factory, which will be in active operation within the next few months, embraces two distinct and independent plants, each with a capacity for turning out from 700 to 750 gross boxes per day of ten hours.

Upholstering and Trimming

Furniture Pulls in Period Designs

Should Harmonize in Finish and Outline—Buying Public Showing Greater Discrimination

By C. R. Read

The style and design of the trimmings and hardware used on a piece of furniture should be given the same close attention and the same thoughtful consideration as the lines and proportion of the article itself. Such items as pulls, knobs and similar forms of decoration, may be considered of little importance, yet it is such seeming trifles that often make or mar the beauty of a piece of furniture.

One often finds furniture in period design, trimmed with hardware belonging to an altogether different style and which as a consequence does not harmonize. This might have been due to an oversight, to lack of knowledge or to the fact that the hardware for that particular period was temporarily out of stock. Whatever the reason, such a practice tends to discredit the piece, and even the whole line, in the eyes of the knowing and discriminating buyer.

The ever-increasing demand for fine furniture in period styles and classic designs is due, largely, to the fact that the general public has at last awakened to the attractiveness and desirability of well-proportioned and well-designed furniture. Coupled with this increased interest and perhaps the very cause of the present-day demand for high-class furniture, is a greater knowledge of, and a closer acquaintance with, the older period styles. To one who has but recently delved into the lore of old furniture, and who has discovered the fact that the furniture and mounts should harmonize in design as well as in finish, the finding of a Queen Anne pull on a Jacobean table would come as a distinct shock. The same applies to one who knows and appreciates period styles.

There is a direct relation between the mounts, hardware and the general design of a piece. One of the most subtle charms of well-designed furniture is the quantity and kind of ornaments and the fact that these and the article itself seem to blend into one harmonious whole. This would apply as much to the color and finish of the hardware used as to its design. This fact must never be lost sight of in selecting and attaching furniture hardware.

The accompanying illustrations show a number of period pulls from the line of Foster, Merriam & Co., Meriden, Conn. The centre illustration is that of a small

Queen Anne 1702-1714

pull suitable for furniture in Italian Renaissance style. It harmonizes in shape, detail and finish with the general characteristics of furniture of that period.

Jacobean furniture is quite popular at the present time. This is usually in oak in a dark or fumed finish. This style is sometimes called Charles II. The term "Jacobean" is all embracing and may be applied to practically all furniture produced between 1603 and

William and Mary, 1689-1702

Italian Renaissance 16th Century

Jacobean, 1603-1660

Charles II., 1660-1685

Adam 1785-1800

Chippendale, 1754-1770

1685, which would include the reigns of James I. and II. and Charles I. and II. This style is solid and substantial in appearance, running to straight lines. Heavy bulbous turnings and twist turnings are often used. Some of the pieces are more or less architectural in appearance. Panelling and mouldings laid-off in geometrical pattern are often used. The two pulls shown in the figures 2 and 3 are very appropriate for furniture in Jacobean style.

The William and Mary style follows next. The furiture of this period is influenced to quite an extent by the Jacobean lines. The pulls for this type of furniture are knobs or small pear-like drop handles. These latter harmonize nicely with the turnings so common to that period. In the Queen Anne furniture these drop handles are replaced by plainer handles in shaped brass. In these pieces the duller finishes are preferable to either buffed or polished brass.

The same remarks apply to the illustrations showing pulls for Adam and Chippendale furniture. These harmonize in detail, general contour and finish with the chief characteristics of the furniture to which they belong, while some of these designs may appear to be applicable to other styles than that for which they were intended, yet correct usage and greater knowledge on the part of the buying public require that every consideration be given to selecting and attaching the most suitable trimming.

Upholsterers Endorse Open Shop

The National Association of Upholstered Furniture Manufacturers, whose offices are located at 110 South Dearborn Street, Chicago, have instituted an open shop campaign for "The American Plan," as it is termed. Mr. Maltby, the secretary of the association, states that 97 per cent. of their membership are now running open shop. He said: "There has been uniform rallying to the open shop standard by manufacturers. The campaign was opened under the direction of Mr. Fennell, our industrial relations director. We have been uniformly successful in Milwaukee, Evansville, Boston, Philadelphia and Baltimore. It is the big work of this association this year. The open shop campaign signs have been called for largely by the manufacturers in the metropolitan centres."

These signs read as follows: "This Shop is Operated on the American Plan."

"Every man and woman working here will be protected in the right to earn an honest living in return for honest work."

"No employee of this company need belong to any outside organization to get justice and a square deal."

Training School for Upholsterers

Quarters.—The floor space is selected convenient to the manufacturing district and of sufficient size to provide working room for at least one pupil for each manufacturer taking part in the plan.

Selection of Learners.—Young men, between the ages of 20 and 25, are selected, preferably those having some responsibilities such as a wife, children or parents to support. These are selected with little publicity, eliminating those with previous exaggerated wages from war work or other special conditions. Not only is the applicant examined but his home is visited to see that conditions there are such as to make him a desirable employee, and his past record is carefully investigated. If found satisfactory to teacher and the factory desiring to employ him, he is then engaged and starts in the school.

Learner's Wages.—Each learner is paid a beginner's wage or reasonable sum weekly by his employer. This weekly wage continues regularly until it is decided by the teacher and employer that the learner is either unfit for further tuition or is sufficiently trained to work in the employer's shop.

Learner's Work in School.—The employer is to deliver to the school materials necessary to make up pieces of furniture. The entire time of the learner, under the supervision of the teacher, is devoted to turning out the work which, before it leaves the school is to be in good marketable condition.

Educating the Learner.—To offset undesirable propaganda, the teacher will each day, at lunch hour, devote fifteen minutes to teaching Americanism and loyalty to employer's interests.

The Teacher.—He must be a practical workman

who understands the art of handling and training men. He is employed at a salary and expenses agreed to by him and the committee of employers.

Control of School.—The school is controlled by a committee selected from the employers taking part. This committee handles the finances, exercises economy in running the school and makes reports to the employers. Funds are provided by a fixed payment from each employer, this giving him the privilege of keeping one learner in the school at all times.

Trained to One Operation

A practical application of the above plan has been made by the Upholsterers' Association, and at least one school is in operation. The advantages are apparent. The attendance at the school is increased, diminished or stopped entirely according to the need for workmen. The learner is earning a large part of the cost of training him; he is trained according to the best practice and in a way fitting him for work in any member's shop. He is trained on one particular operation or on all operations, at the option of his employer. Workmen from the factory can be sent to "brush up" on unfamiliar work or fitted for higher or different work. And, best of all, a class of workmen is developed, loyal, competent and permanent.

Segregation of Operations in Upholstering

The Industrial Relations Department of the National Association of Upholstered Furniture Manufacturers has worked out a training system for workmen by which an unskilled workman is trained to do a fair grade of upholstering work inside of sixty days; and in less than six months an all-round first-class upholsterer is produced. A most remarkable result of this system is that the time required to make a certain article has been reduced on an average 50 per cent.

The standardization of wages was found to be the first necesasry step. It was discovered, by a survey of wages paid in Chicago, that there was a variation in rates on the same work as great as 50 per cent. This suggested time studies on operations and, eventually, an entirely new way of dividing the work among the men.

Formerly, each skilled workman made an article complete. There was no division into separate operations. Naturally, no workman was equally efficient on all parts of his job. If he slighted a part of his work it could easily be covered up in the finishing part. There was no chance for him to specialize on the part in which he excelled or which he preferred.

Now there is a complete text-book on the making of upholstered furniture. The making of each article is divided into seven operations. The proper working-time on each operation is given. Workmen specialize on each operation instead of trying to become proficient in all of them. Wonderful improvement has resulted. Not only has there been the great saving in time and cost, as before mentioned, but the work is done better. Each man is an expert on his own particular operation and serves an inspector for the preceding operator to save himself from responsibility for bad work.

The advantages of the new method are so apparent to upholstered furniture manufacturers that the Industrial Engineer of the Association, Mr. G. D. Pettibone, is now devoting his entire time to applying the system in the various plants.

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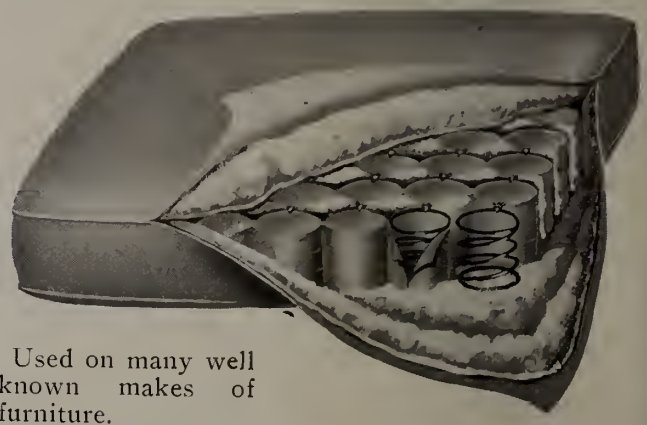

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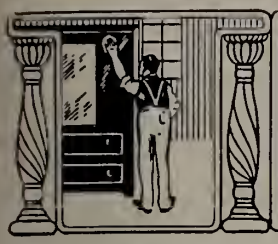
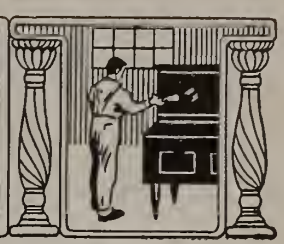


THE FINISHING ROOM



Removing Varnish and Other Finishes

Simple Formulas for Varnish Removers—Suggestions Tending for Satisfactory Results—How the Removers Should be Handled and Applied

By John N. Moore

There are many cases where woodwork has to be refinished in the finishing room of some of our modern manufacturing plants. In practically all cases a refinishing job cannot be effectively done when the old varnish remains. It is bound to detract from the appearance, and should be entirely removed to insure the best work.

If the old coating is in good condition, it will need only a rubbing off with fine sandpaper or a handful of steel wool to remove the gloss and leave a proper "tooth" for the new coat of varnish. In the old days they used to take off this coat with the scraper, sandpaper and perhaps alcohol. Then there is glue which will pull the old coating off clear to the wood. but in these modern times many commercial removers are on the market, and are equally effective, having found a considerable use. Many of these are put out by various paint manufacturers under trade mark names and do very good work. There is another old form of remover and that is ammonia. Still another is potash, and in fact, any caustic, such as lime, will do the work. It is simply a question of convenience and character of the work that is to be done, which determines which remover to apply.

Working With Banana Oil

A few notations covering this subject will prove interesting, and, we hope. helpful. Banana oil is much in favor with painters in removing old varnish. While some object to its odor, it does not injure the flesh or the brush, but eats rapidly into the old finish, clear down to the wood if not checked, but it does not injure the wood itself, only you may not want the filler to be disturbed.

This banana oil is so energetic that in case you wish the surface only removed, you had better try something not so strong in action. One good plan is to mix banana oil or liquid with alcohol in such proportions as will meet the requirements of the case in hand. Such a remover will eat off the first coating immediately and leave the surface in prime condition for refinishing. Simply rub it off with a rag which has been moistened in benzine. As this liquid remover dries very fast it will not do to take too large a surface at a time. Wet a small part and remove the soft stuff as quickly as you can, for if left to dry, the old varnish becomes nearly as hard as at first.

Be careful when using such liquids that the room in which you are operating is well ventilated. If working in a closed room the workman who becomes dizzy or in any way below normal should get out in the open air as quickly as possible, especially where wood alcohol is used the fumes are injurious and all this seems in favor of the purchase and use of some of the standard paint and varnish removers. In using any of them care should be taken not to get down into and injure the filler, and to prevent this the soft varnish should be removed at once, just as quickly as it commences to lighten up. Wash off with benzine and a rag just as soon as the varnish has softened.

Wax Retards Rate of Evaporation

Use all of your removers economically. By that we mean, don't waste them, make every drop do its part. Such liquids are prone to evaporate quickly. The addition of a substance like wax serves to retard this hasty evaporation. About the best wax for this purpose we believe, is cerisin. Without this addition it will be almost impossible to handle some of these volatile liquids, but with the use of the wax, the spirit is held in check so that it will remain long enough to do its work effectively. This method will also enable you to work a larger surface. Practically all commercial removers contain a retarder which forms a coating that keeps out the air and keeps the fugitive spirit in which is a good point.

We are giving a formula for a fusil-oil-benzole remover. It will be found useful for softening old varnish and paint brushes, for removing tar, varnish, lacquer, enamel, paint, etc. Mix together four ounces of benzole, three ounces of fusil oil and one ounce of denatured alcohol. You should observe the same proportions for making larger quantities.

The merit of a varnish remover can usually be determined by the time it takes to eat into the old varnish. In its most effective form it will begin at once to eat into the old film. This is quite important in the case of upright or overhead work where the liquid is apt to run down. By quick action the liquid takes hold of the old surface and does not run. Some of the commercial removers are prepared in a sort of semi-liquid form, which is a great aid in accomplishing this kind of work. Removers containing wax or some equally effective retarder are therefore useful on work of this character.

Alcohol Often Employed

Where the varnish coating is not hard and thick you frequently find alcohol a very satisfactory remover, and the alkalis are often all that is required. Salsoda and water in certain proportions will do for some kinds of work. Alkalis eagerly attack oils, and as varnish. including shellac, is largely a composition of oil, it will be seen that alkali is the thing to turn the trick. Of course it has its objectionable features, in fact, most removers have. When using a form of alkali remover, as soon as it has been applied you may take a wad of steel wool or even sandpaper and go after the spots that have become softened under the action of the alkali. A stiff bristle brush is also used for cleaning out small parts of mouldings, carvings, etc. When all the stuff is removed apply a wash of acid to neutralize the alkali. or wash off with plenty of water.

It is best where you can do as large a piece of the work as possible to let the material stand for some time before trying this. Usually only twenty minutes or

a half hour is necessary. If, when you try it, the old varnish does not loosen up readily, give it another spread and let it stand for a little while longer. The purpose is to get the whole mass loosened up before washing off. A lot of time can be wasted in working on small spots or surfaces, and provided your remover is the right kind this will not be necessary.

Always keep the container well stopped as there is always liable to be a loss from evaporation. While there are a number of formulas accessible for the making of removers we believe the good standard brands will do the best work, just the same as ready mixed stains or enamels are often an improvement over the the hand mixed varieties.

Could Work of Varnish Sprayer be Improved?

Intelligence and Efficiency of the Operator Big Factor—Certain Points that Tend for Better Results—What is Best Air Pressure for Varnish?

By A. E. Smith

The air-finishing equipment or varnish sprayer like any other piece of machinery, requires a certain amount of attention and humoring for best results. One often hears these machines condemned because of certain undesirable features when the fault lies entirely with the operator, the way he manipulates and handles the sprayer and finishing materials. It is well to remember that spraying equipment is in general service, is being used on a wide variety of articles, for many different finishes, and in giving good results. If you are experiencing difficulties either with the sprayer itself or in the quality of the finish, it is well to do a little investigating and experimenting before condemning the machine.

Some Pertinent Points

There are a number of important factors which affect the work done on a varnish sprayer and which must be given careful attention before absolute satisfaction can be expected. They are: temperature of work, room and material, air pressure, purity and dryness of air; cleanliness of work and finishing room; care of sprayer; quality and condition of materials applied, and, lastly, intelligent operation. Without intelligent operation, and, perhaps careful supervision, it is highly improbable that the above features will be correctly controlled and regulated. Skilled operators of this important machine are in good demand, so it is the part of wisdom for all finishers using a varnish sprayer to thoroughly master all the intricacies of this method of applying finishes.

Anyone familiar with the application of finishing materials knows the importance of temperature regulations. A good finisher would not think of applying chilled varnish neither would he consider applying a varnish coat to a cold surface. The same applies to the varnish sprayer, perhaps, even to a greater degree. The temperature of the finishing room should also be evenly maintained at a satisfactory level.

Should Heat be Used?

The advisability of using a heater to warm the material before its application is often questioned by the operators of spray machines. Some use the heater for most of their work while others disregard it altogether. For enamels and varnishes or any material containing varnish, the heater offers certain advantages that are worthy of consideration. By applying such material warm, a heavier coat may be given, thus eliminating one or more coats, effecting a saving in time, labor and material. If the material is applied warm to a warm article, it will flow out more evenly, giving a smoother surface, one that requires less rubbing down, reducing the time consumed in polishing.

The air should be pure and clean, goes without saying, but it must also be free from moisture and oil. Moisture or water in the air results in a spotted finish, while oil causes a mottled effect. A device for removing moisture from the air line was described on page 111, of the December "Canadian Woodworker." The air receiver should be drained regularly, once or twice a day. The oil is removed by inserting a suitable filter in the line. It is not enough that a device for removing the oil or moisture from the air be installed. After being put in, it requires a certain amount of attention to keep it in proper working order and make sure that it is doing its work.

Air Pressure of Prime Importance

Air pressure is an important question, one that to a certain extent must be decided by each individual operator. Some general pressures might be given, such as 50 to 80 lbs. for varnish, 30 to 40 lbs. for stains, and 30 to 50 lbs. for shellacs. Such factors as the quality of the finish desired, the grade, viscosity and volatility of the material being applied, must be given consideration when deciding on the most suitable air pressure.

Another point that is seldom considered is, at what distance from the work should the nozzle or "gun" be held to give the best results. It is good practice work as close to the surface as is consistent with good work. There is less material wasted and a better surface secured if this suggestion is followed. A good rule for all spray operators is to keep close to the work, say 6 or 8 inches, and use the lowest air pressure that will break up or atomize the material.

Oil and Turps Reach New Low Level

The market for linseed oil, turpentine and white lead has begun to steady down again after a somewhat spectacular drop from the prices prevailing in the spring and summer. Paint manufacturers now think that prices have at last reached a rock bottom level. In linseed oil the summer price was $2.80 per gallon of nine pounds for the raw oil. It is now selling at about $1.15 per gallon. For the boiled oil the summer price was $2.83. Now it is down to $1.18. In turpentine the summer price was $3.77 per imperial gallon, now it is $1.55 per gallon. In white lead the summer prices were $19.50 for five-ton lots, $20 for one-ton, and $20.33 for lots of less than one ton. The prices are now quoted as $17.25 for five-ton lots, $17.75 for one-ton, and $18.10 for lots of less than one ton. One reason given for this decline in prices on finishing materials, is that there was a shortage of these products during the last summer but now that supplies have become more normal, values have naturally declined.

Phases in the Development of Wood Finishing

Interesting Sidelights on Development of Finishing Methods and Materials— How Some of the Modern Finishes Came About— Relation of Filler to Stain

By C. J. Lavallee*

Wood finishing is rapidly taking its place among the recognized arts. This may sound extravagant. Nevertheless it is truer to-day than it ever was in the world's history. The cause of it is doubtless the marvellous growth of the furniture manufacturing industry and the influence of this on interior decoration. Some of the finest examples of furniture designing that we have to-day are products of the master craftsmen of centuries ago, and while we see modern designers copying the ideas of these old masters, we also see vast improvements over the old methods and processes of finishing. In this we have gone beyond the wildest dreams of Chippendale and his contemporaries.

Not that finishing is on a higher plane than formerly. The old-time finisher filled the pores of the wood with coat after coat of varnish, scraping down each coat until, after a long space of time, the surface was level; insuring a very fine and highly durable finish. But he consumed months where the modern finisher consumes days. With the latter, volume and speed of production are paramount. The old methods are ruled out by their slowness. While latter day methods may have sacrificed some measure of quality and durability, the loss is so small as to be almost negligible when the gain in efficiency is duly regarded.

Finishers Inspired By Nature

It has been truthfully said that there is nothing new under the sun, and the staining and finishing line is no exception to the rule. Looking back over the years, we see numberless inventions which astounded and amazed the world. The application and the working out of the idea might be new, but in nine cases out of ten the idea itself was not new. So in the finishing line. We claim to have made great discoveries and improvements, and we have, but where did the underlying ideas come from? They came from nature, and all that we can do is to imitate the effects of the sun, the rain and the years.

The old masters must have realized that their main difficulty lay in properly finishing their work in order to protect and beautify it. Hence, in order to avoid filling and its attendant troubles, they used, in most cases, close-grained woods. The finishing on these consisted of painting and varnishing. Some of the old pieces made by Sheraton had the panels painted by Angelica Kaufman, a German woman, whose long residence in England anglicized her to a great extent. Her medallions are exquisite examples of the art of that period. Most of her subjects were taken from Greek mythology.

It is curious in observing the trend of those times, to notice how fast they changed from the thin, spindly designs, to the heavier, massive creations made out of harder and more open-grained woods. To the student of evolution it presents an interesting study. He can look around him to-day and readily pick out shades and designs upon which the past has put its stamp.

One of the most artistic and popular finishes of the past was the Mission, and we can directly trace its origin to the Mission period of certain parts of our country. The term "Mission" formerly meant a style, but now it signifies a finish as well as a design. This period has had a tremendous influence upon the shades and finishes in vogue to-day.

Denninger, of Mayence, Germany, was one of the earliest to devise processes for the staining of wood. He confined his attention almost entirely to alcoholic mixtures, because at that time, to stain a piece of wood took a week or longer. Where water stains were used the pores of the wood were opened so widely, and the grain raised so badly that a good finish was almost an impossibility. Hence his attempts were all confined to a stain of a spirit nature.

His efforts, contrasted with the customs in vogue to-day, were very crude and depended to a great extent upon reactions which took place upon the wood itself. For instance, if a golden yellow were wanted, he would saturate the wood with a solution of tin chloride, and then place it in a tight room where it would come into contact with the fumes of sulphide of hydrogen. A reaction would of course take place on the wood and a golden yellow compound be formed known as tin sulphide.

Other of his processes called for boiling the wood for as long as a day in one bath and then an equally long time in another before the staining was complete. He was strongly opposed to the use of such violent acids as hydrochloric, sulphuric, etc., believing they had a deteriorating effect upon the materials used in finishing the wood. Denninger is but one of a number, during his time and after, who worked upon stains for wood with more or less success.

Advent of Wood Dyes.

The wood dyes came in about this time. They were an improvement on the metal solutions and for many years were considered standard. However, no great strides were made until the discovery of coal tar derivatives, from which time is dated the birth of the wood stain business. The history of the discovery of the various colors reads like a romance. Many of them were made, accidentally, by some old German chemist who, hunting for something else, unsuspectingly put the right reagents together. Others were worked out systematically. Coal tar has proved so prolific that no prophet can say how far it will be developed.

Until about the year 1890 wood finishing had been going along the even tenor of its way, with but few radical changes. Oak was beginning to be appreciated as a cabinet and building wood, but its possibilities had hardly been dreamed of. About that time the 16th Century fad came into favor, but it did not last long, and the Antique followed, which was produced by coloring the filler.

The Age of Golden Oak.

The real awakening began about 1898, when, through an accident, that most beautiful and effective finish, Golden Oak, was born. There never was a finish that brought out to such an advantage that king of our native woods, the white oak of Indiana and

*President, Marietta Paint & Color Co., Marietta, Ohio.

northern Ohio. It is still popular, and the fact that it is being imitated on all cheaper woods proves my assertion. This finish, or effect, has remained in favor longer than any other special finish since oak has been used in furniture.

It was at that period that I entered the ring as a manufacturer and if modesty did not forbid, I might say that the keystone in the arch of our success was Golden Oak. This required so much research work in the laboratory that it has since been comparatively easy to meet the issues, as one after the other, the different effects on oak have been evolved. Let us take as an example weathered oak.

Weathered Oak.

The original of this was not a finish at all, but rather an effect produced by long years of service under exposure, which accounts for the soft, indescribable mixture of gray, green and brown, which has been so aptly called "weathered." In the early stages of this fad, we attempted to reproduce this effect and succeeded, but it could be done only with an acid or water stain and, on account of the great amount of labor necessary to effect a correct finish, it could be used on but the finest examples of this design.

The maker of a medium grade of mission furniture soon discovered that a more economical method of finishing must be devised, so he came to us with his problem, and we solved it with our Spartan process; enabling him to reduce his finishing cost about 50 per cent. without materially affecting the quality or the artistic effect of the result. I firmly believe that "weathered oak" would have retained its popularity, if the original idea of adhering to the mission design had not been lost sight of. The artistic merit of this finish brought out "weathered oak" on all kinds of furniture of no particular design, making it so commonplace that people of refined tastes soon demanded a more exclusive effect, and from the ashes of the weathered arose the "Early English," erroneously called a mission finish.

Early English Not "Mission."

The true Mission shows an open pore and depends entirely upon the depth and beauty of tint for its effect; while Early English is a solid finish—the pores being filled to produce a smooth, level surface. It shows the beauty of the oak by contrast, accentuating the high lights in the same manner as the Golden Oak but much more subdued. Early English also has been very popular and still retains some hold upon the people, but for the same cause that marked the decadence of the Weathered, it is being displaced by that most beautiful and artistic effect, the Fumed Oak.

This effect, as its name implies, was first obtained, and still is, to a certain extent, by exposing the oak to the fumes of ammonia, then coating over with shellac and rubbing dull. On some pieces the result was most beautiful. Fumed Oak was at once favorably received by the trade and promised to become very popular, but on account of the great difficulty in producing a uniform effect on the various kinds of oak used in cabinet work, it was soon seen that it was not as simple an operation as had at first appeared, and the great majority eliminated it from their lines for the time being, so that not much was done about it for several years.

Fumed Oak Still Lives.

However, as has been the case with nearly all new finishes that have real merit, fumed oak did not die out. A few of the more persevering ones kept experimenting until a process was found that enabled them to produce a reasonably uniform color effect on nearly all varieties of oak, but here again, it was an expensive operation.

We had been watching developments all this time, and as soon as the demand for this finish forced the trade to add it to their lines, we were ready to offer our acid stain, enabling them to compete successfully with as high grade a finish and effect as the original, but at a much lower cost. The trade was quick to see the merit in this process, and this finish jumped into favor at once, so that there is now scarcely a manufacturer of wood work that does not offer a fumed oak line.

This is a fair description of the birth and growth of some popular fads and fancies in the finishing world.

If these several finishes remained true to the name, so that a standard could be established, the manufacture of stains would be a simple operation. But we have no sooner mastered a certain shade, or tint, than we are asked for something more on the brown, or green, or gray—or a little darker or lighter, until out of the maze we usually manage to evolve a medium shade, which is used as a standard, and after a time it becomes so in fact.

As I said in the beginning, many of these effects (some of them most artistic) are named after Old World master designers, and not the particular shade or color used in his day to bring out the best in that design. As, for instance, we are suddenly requested to furnish a stain to produce a Flanders effect on oak. We know that the name implies a design only, but being familiar with the period when this design was brought out, we soon evolved a stain that produces the required effect. The same can be said of the Flemish, the Baronial, the Sheraton, the Chippendale, the Cathedral, etc. There is this to be said, however, of the Cathedral. It conveys more meaning to the mind of one familiar with the subject than any of the others above mentioned, because, while it denotes a special design, one can readily picture the effect of the light shining through the beautiful art windows in one of the mammoth temples of the Old World, blending the ambers, greens, blues, yellows and reds in one harmonious golden brown tint.

Silver Grey formerly produced only by boiling the veneers in a solution of sulphate of iron, is now satisfactorily made with an acid stain applied with a brush, making it possible to get the effect on all kinds of cabinet work. It is usually correct only on maple, however—a special stain being necessary on other woods.

Difficulty With Mahogany.

We now come to mahogany. For many years an acid or water stain has been used with good results on all kinds of woods, but like all successes, it has its drawbacks, and one of the most serious of these is the raising of the grain of the wood. On built-up furniture, it is especially objectionable, on account of the water swelling the wood and breaking the joints. Then again, the veneers used in many instances are so thin that when soaked with water they blister badly and often have to be removed and replaced at great expense. With these points in mind, it is not difficult to appreciate the demand for a so-called oil mahogany stain.

The first question that arises is—what are the chief claims for or against an oil stain? If I were asked that question, (speaking of a genuine oil stain) I would say, that for a surface exposed to the elements, such a stain is the best, from the fact that being made by

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reducing pigment colors with oil, turpentine, etc., it covers and protects the surface as would a thin paint, (which in fact it is). It naturally retains its color longer, but for interior finish where a real wood tint is desired, the day of oil stain has passed, because it is necessarily made from pigment colors, and lacks altogether the depth and brilliancy of the acid or water stain. We must then look elsewhere for a material which possesses these qualities, and at the same time is entirely soluble in the proper vehicles. This we find in the coal tar dyes, known as the oil soluble group. In this group can be found almost every color of the rainbow, and by blending intelligently most of the effects obtained with acid colors can be duplicated quite satisfactorily.

There is this exception, however, that these stains do not possess the mordant properties of an acid, and are therefore much more transparent; hence the clearness and great brilliancy. In some instances this is considered an advantage but owing to the fact that most of the stains are made to match a water stain, it was necessary that some way be found to overcome and diminish what at first seemed to be its chief claim. This demanded another long series of experiments, and after many attempts the solution was found to rest in the proper mixture of the several coal tar solvents, and especially prepared alcohols.

Essentials of Modern Stain.

A number of delicate points had to be kept in mind:

First: The combination of ingredients must be correct in shade.

Second: The vehicles must be so well balanced that the whole would be in perfect solution.

Third: It must penetrate deeply into the fibre of the wood.

Fourth: It must not raise the grain.

Fifth: It must evaporate absolutely, and yet leave the stain properly bound, and lastly, it must hold its color reasonably well, at least sufficiently to compete in non-fading qualities with the water or acid stain. We started a long series of laboratory experiments with all the known reagents, following our motto of looking backward, only that we might more surely move forward and avoid past mistakes. The result was a glaze, or toner—permanent in color—absolutely transparent and perfectly practical of application. This was followed recently by the introduction of a new non-fading stain that has all the advantages of an oil stain combined with the non-fading qualities of a water stain.

Points About Fillers

A word or two more about paste fillers. Two points in particular are very important; the first is the close relation of paste filler to stains; making the color of the filler often as important as the stain itself in producing a certain effect or tone. The second is the difference in the quality of fillers. I have many times marvelled at the indifference manifested by users of paste fillers in general. Some select the filler for the color, others simply to fill the pores, seeming to forget that both qualities should be found in a well-balanced filler. But there is one point that is being insisted upon by the discriminating buyer after he has been shown the advantage of it, and that is—the filler, in addition to all the requisites mentioned above, must dry so hard, that one coat of finish can be omitted without impairing the beauty or durability of the work.

In the brief space of this brochure, I have tried to give some idea of the history of wood finishing—its evolution through various stages leading up to its position of importance to-day. Volumes could be written on this subject to cover it thoroughly, but I have undertaken the barest outline. I feel it to have been my personal good fortune to have been able to contribute somewhat to this development, but am especially gratified at whatever success I may have achieved in translating the purely theoretical or experimental knowledge of the laboratory into the practical knowledge of the finishing room.

How to Test Linseed Oil

Linseed oil is the base of many materials found in the finishing room. Unless a good grade of oil is used, the resultant mixture, whether filler, paint, enamel, etc., will in all probability be very slow drying and may exhibit other objectionable features. Unless the finisher knows how to test linseed oil, he may, unwittingly, be using an adulterated or inferior grade of oil.

There are a number of simple tests which may be applied, some of which are more or less accurate. Some finishers, who are of an observant nature and who have had years of experience in working with and handling linseed oil, may be able to judge the quality of a sample of oil by such qualities as smell, taste and "feel," but these men are few and far between and at the best this test is comparative and by no means accurate. Again, others use what is known as the acid test. By placing the oil and acid in a test tube, together, and mixing them, if the oil does not change color, it may be considered of a good grade. On the other hand, if it does change it is presumed to be doctored or adulterated. As certain oils, which are known to be adulterated, do not show a change under the acid test, it cannot be considered to be reliable, unless, of course, a change of color should take place.

One of the simplest and, at the same time, most reliable tests, is what might be termed "the boiling test." It is a well-known fact that linseed oil has the highest boiling point of any oil. Taking advantage of this fact, determining the temperature at which a sample begins to boil, will enable one to form a very accurate idea of the quality and purity of the sample under test. The apparatus needed is very simple, consisting of a small iron pot, alcohol lamp and thermometer. This latter should register as high as 700 or 800 degrees.

Place a few ounces of oil in the pot and heat until it boils. If the oil is pure, this will be in the neighborhood of 550 degrees F. When the oil has reached 475 degrees, 500 degrees it will flash; that is, the oil will ignite if a burning match or taper is held about ½ inch above the surface of the oil.

An adulterant often employed is cottonseed oil. This has a very low flash and boiling point. Linseed oil, to which cottonseed oil has been added, can be readily detected by its low boiling and flash points. If linseed oil boils at a temperature lower than 535 or 540 degrees, it is either of a very low grade or has been mixed with other oils.

Walnut Manufacturers to Meet

The annual meeting of the American Walnut Manufacturers' Association will be held at the offices of the Association, 616 South Michigan Boulevard, Chicago, Illinois, on Thursday, January 20, 1921.

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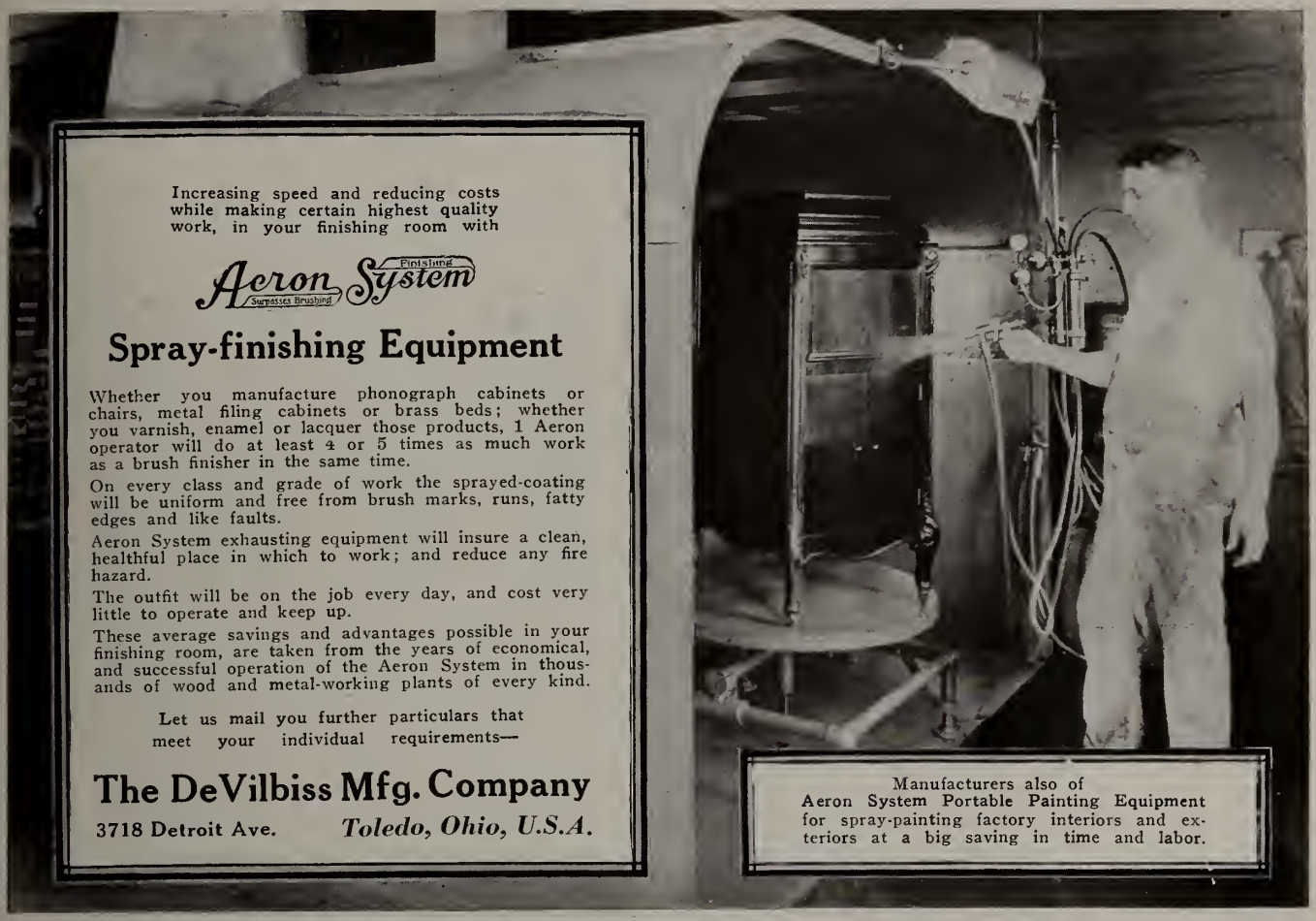

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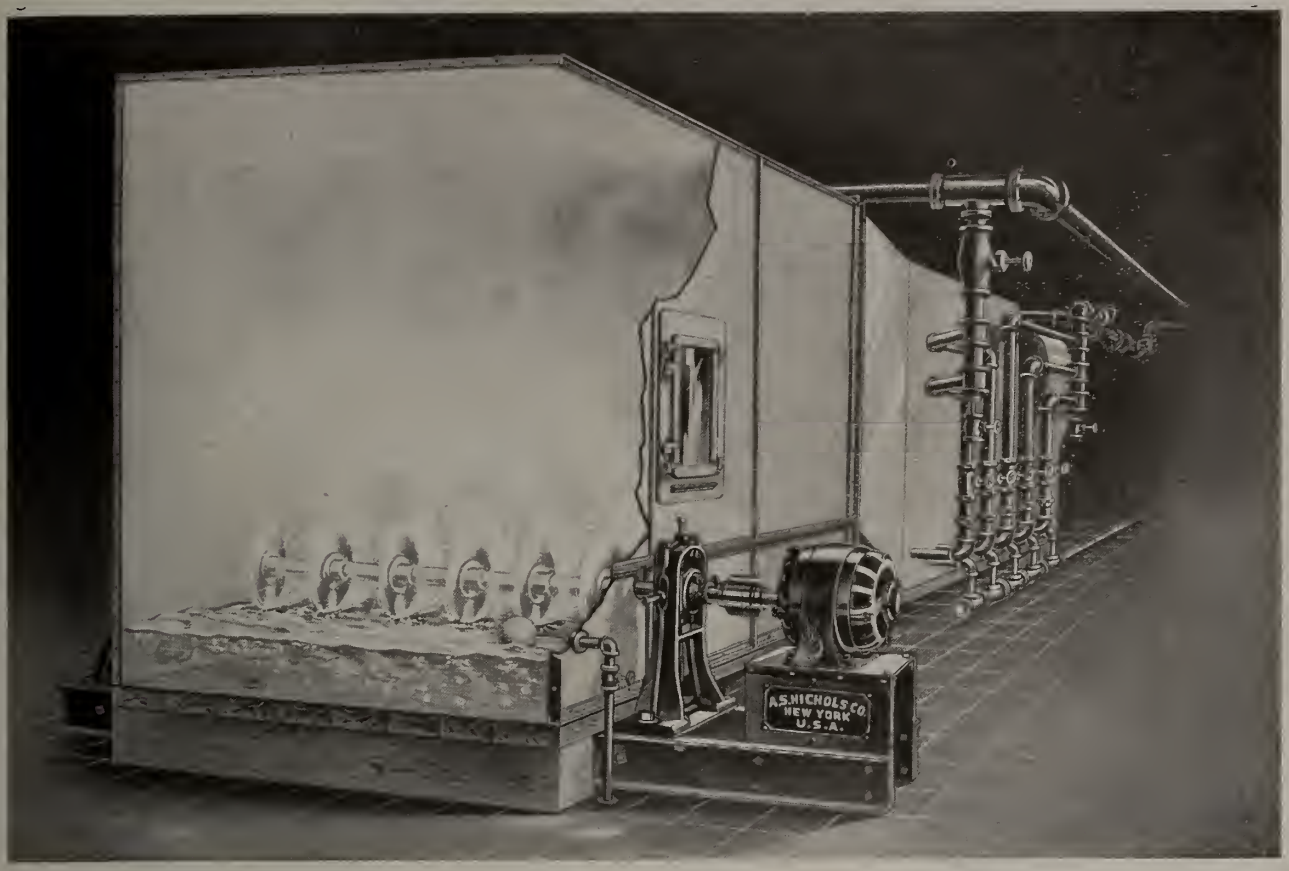

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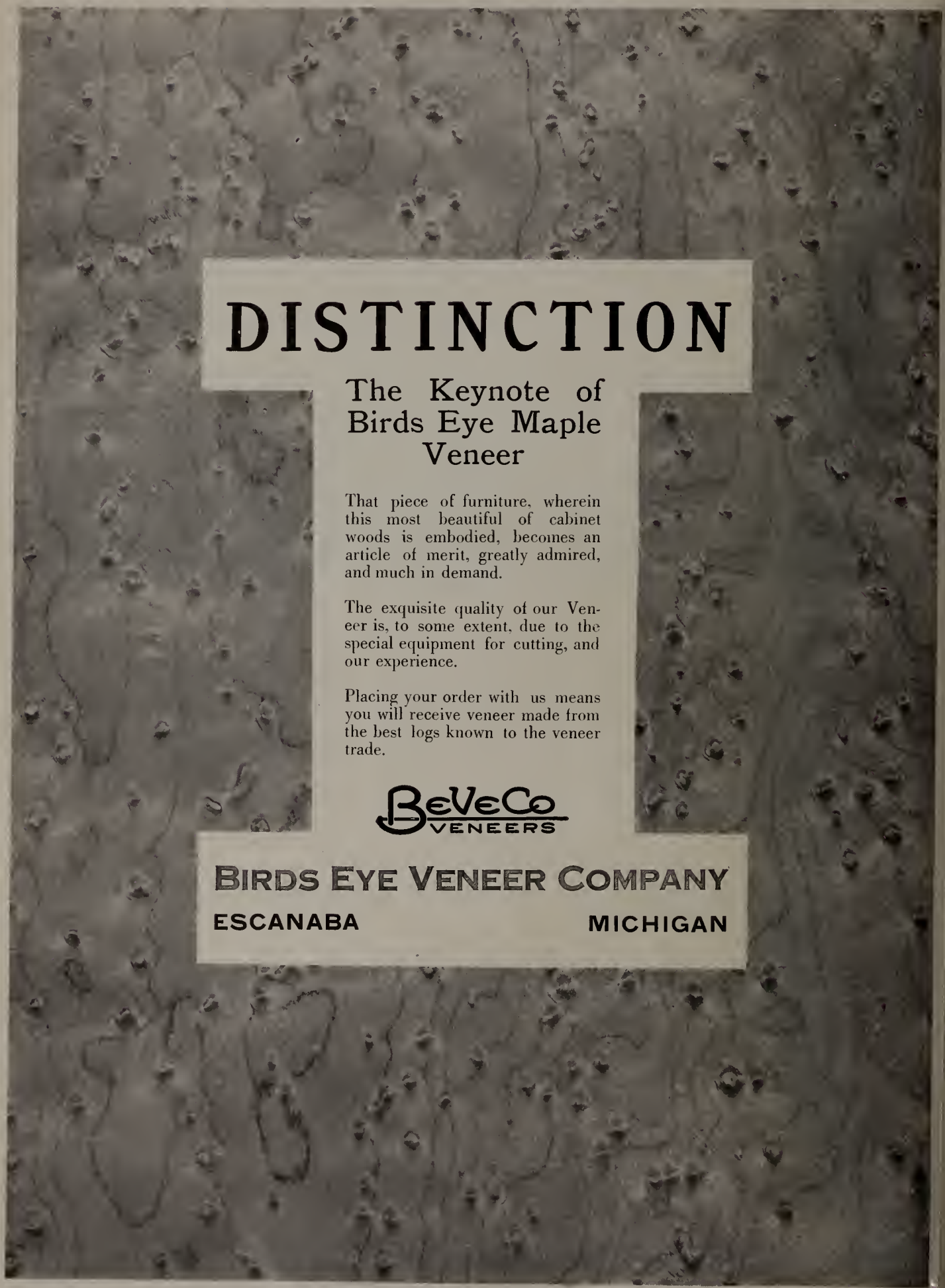
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Veneers and Panels

Is Your Glue Room Systematized?

Uniformity of Operation Specially Adapted to Economical System—Lift Truck Employed to Advantage—Marked Effect on Production

By Veneer Foreman

There is probably no department in a woodworking plant into which efficient handling methods can be so readily introduced as the veneer department. This is due partly to the fact that there is a certain uniformity to the product and also that the sequence of operations is the same in nearly every instance. That being so, it is a wonder that the average glue room is not conducted on a more efficient basis.

In the ordinary factory veneering, cured and irregular surfaces is the exception rather than the rule, so that this phase of the work need not be given too much consideration, from the point of view of reduced handling costs. In piano factories and other plants where the veneering of curved pieces constitutes a considerable part of the work going through, one finds special forms and presses that facilitate this work. Here production is not such a big factor, although the same ideas are applicable. If panels, case fronts, tops or similar plain surfaces comprise the bulk of the output of a veneer room, there is plenty of scope for systematizing the work so that greater production and lower costs will result.

How System Is Worked Out

Uniformity of product means that uniform methods of handling can be adopted and a regular system installed. Probably the best method of moving veneers and panels in both large and small plants is with the aid of suitable platforms and an elevating or lift truck. As these platforms do not take up much room when empty, for they can be stacked, and are not very costly, a sufficient number may always be kept on hand to take care of all the requirements of the department. This means that all rehandling may be eliminated, thus effecting a saving right at the start. If the work goes through in small lots, the platforms may be built such a height that all stooping is done away with. In any case, it is a good idea to provide a few high platforms to take care of the small lots.

As the veneers crossbanding and, in some instances, the covers, are got out and rough sized, the pieces are marked and piled on a conveniently placed platform, which when filled may be moved to the next machine and placed convenient to the operator or may be run to some allotted parking or storage area where it stands until required. As each succeeding operation, such as jointing, taping, etc., is performed, the pieces are always piled on the ever-handy platform. As the moving of a loaded platform from one operation to the succeeding one consumes but a few seconds, the work may be said to be laid down by one operator and picked up by the next man with a minimum of lost motion.

To permit of the free movement of loaded trucks from one operation to another it is absolutely essention that provision be made for keeping the aisles clear and unobstructed at all times. This means that suitable storage space, conveniently located, must be provided. Some manufacturers mark off the aisles and passage-ways by heavy white lines, painted on the floor, and make it imperative that no obstruction be permitted to remain between the white marks.

Someone may think that this is carrying the movement and handling of work to a ridiculous extreme. Unless some simple systsem is worked out and followed, it is almost impossible to avoid a certain amount of delay and needless movement and shuffling of trucks.

As the veneer room is a highly specialized department, the equipment may be placed to the very best advantage, for practically all the work handled. This feature should be considered. It is possible to arrange the various pieces so that the work moves from saw to jointer, taping machine, redrier, glue spreader, etc., in a direct line, without any confusion on recrossing, thus taking full advantage of all the benefits of straight-line production.

Increase Production Results

When this is done, it is usually found that more work is put through as to a certain extent, each workman makes an attempt to prevent the material from piling up behind him and unconsciously works a little faster. Another feature is that where the work is conducted in an orderly, systematic manner, it has a subtle, far-reaching effect on the workmen, resulting in greater care being taken, increased efficiency and a better product.

The platform truck, owing to its extreme mobility and ease of handling, seems to be particularly adapted to the peculiar problems of the veneer department.

Reasons For Glue Failures

Glues are often blamed for failures for which they are not responsible. Tests made at the Forest Products Laboratory of the U.S. Forest Service at Madison, Wisconsin, show that properly handled commercial glue develops a shearing strength greater than that of most woods.

The average glue user prepares his glue with reasonable intelligence but commits atrocities in preparing surfaces to be glued and in handling pieces after gluing. To get full strength from any glue, proper surface contact is imperative. Good glue will adhere fairly well even with poor surface contact. Joints of this kind possess, however, inherent weakness and the added disadvantage that they are more liable to ruin through bacterial action than tight joints, since the glue in them is more exposed.

The proper application of pressure is important in all glued work but doubly so in the manufacture of plywood. Securing proper pressure involves keeping cauls and press in first-class condition and using them

skilfully. With the hydraulic press it is easy for careless or ignorant workmen to spoil a batch of stock by applying too much pressure and starving the joint.

Plywood failure may often be traced to unevenly surfaced cores. Planer work should be watched carefully and calipered frequently. A low spot in a batch of cores will mean that insufficient pressure will be obtained in that place and loose plywood or blisters may result.

Taking chances in storing and shipping glued products causes many failures. Work is frequently improperly dried and is then expected to hold together in damp rooms. Glue attains its full strength only when it is thoroughly dried. This necessitates removing the moisture absorbed from the glue by the wood. Glued work should be placed where there is a chance for good air circulation. After drying, average shop conditions should not cause failure.

New Phase in Selecting and Matching Veneers

Dignity and Strength Rather Than Striking Effect — Advantages of Veneered Work Should be Emphasized—Suggestions for Selecting Stock—Textures Which Should be Avoided

By Albert Hudson

It is gradually being recognized that the veneer room is a scientific department. When we look back into years gone by and think over the way that veneering was done, we wonder how it was possible to turn out a satisfactory product and at a profit. Yet, if we examine any high-class antique furniture, we find that the principal parts, calling for figure and striking effect, are all veneered.

In modern veneering practice we find the dominating note in the use of veneers is one of dignity and strength rather than striking effect. There is evidence of more thoughtful matching of veneers, more careful laying and a general refinement in the use of figure. All of which indicates that an artistic sense is developing, as it should, and that the cabinet work of to-day is worth more than that of bygone years

Eary Beginning of Veneer Industry

The veneering industry is only a little over 100 years old. There is evidence, however, that some veneering was done previous to that. This was the forerunner of the present segment veneer saw, and closely resembled it in general appearance. In his workshop in Battersea he took the circular saw as it was then known and developed the concave saw mounted on disks for cutting veneers. He operated two veneer saws 18 feet in diameter, and two that were 9 feet. These saws were used for cutting veneers from rosewood and mahogany, as thin as one sixteenth of an inch, with great precision. At that time this was considered a wonderful feat. Great improvements have been made since those days.

To-day we see veneer all around us in a great many forms. It makes the very best furniture, phonographs, interior panelling and is even to be found in packing cases. Some few years ago the term veneered furniture was looked upon by the average purchaser as a synonym for cheap furniture, and even to-day there is a prejudice against veneered stock. There is no doubt that this prejudice attached to the term "veneer"is due to the fact that articles have been veneered and sold that did not give satisfactory service. when the purchaser wanted something durable he sidestepped what he called "that veneered stuff," and looked for something solid. It is not a matter of changing the name, however, for if the distinctive qualities, which made it objectionable were to remain, it would, of course, soon be found out and the new name would only add more to its prejudice.

Much progress has been made in veneering and in the veneer department of late years. One can now buy a veneered product with reasonable assurance that it will stand any test. It should be profitable for manufacturers of veneered lines to advertise such facts, stating the why and the wherefore of veneers, assuring all purchasers that it is the highest development of the woodworker's art, and emphasizing the fact that any article, carefully veneered, will give longer service than if made solid.

For beauty, quality and usefulness, built-up stock cannot be excelled. Three or five-ply material, each ply laid with the grain at right angles to the next layer, forms a strong piece of laminated stock, which if made properly, will not warp, twist or split. Apart from furniture and phonographs, built-up stock can be used for interior trim, columns for the verandah; in fact the possibilities of such products are unlimited. It must be noted, however, for such work as the columns of verandah, artistic store fronts and all such classes of work, waterproof glue must be used.

Care in Selection of Stock

In the selection of face veneers, great care should be taken because there are many well-figured veneers that are unfit for high-grade products for two reasons:

1. A soft, spongy texture has a tendency to take up too much color in the staining and always flat under the finish.
2. Because of the natural interchange of smooth, hard and soft streaks, the result being the veneer will show light and dark streaks after staining, and needs toning in the finishing room.

This alone shows that all veneers should be selected according to color and texture. The most artistic results are obtained from veneer of good even figures and texture. Then again, there is what is called "the unsafe veneer." With this veneer, however careful a man may be, the glue penetrates to the outer surface and trouble follows in the finishing room.

New Industrial City Will Spring Up

A new city, whose name, Saguenay City, is already incorporated, is to be built, beginning next spring, near Kenogami, Lake St. John county, by the Price Brothers & Co. This firm intends to establish there a very large pulp and paper plant. The contractors say they will need at least 4,000 men next spring.

View in Toronto warehouse of Panels, Limited.

Panel Industry in Canada Developing

Well Equipped Plant at Southampton, Ont.—Efficient, Up-to-Date Installation—Outline of Methods Followed

A Canadian panel manufacturing organization that has enjoyed a satisfactory growth is that of Panels, Limited, Southampton and Toronto, Ont. This company was organized less than two years ago to manufacture panels and various forms of plywood for the Canadian trade. A plant was installed in Toronto where it was quickly found that the capacity was far too limited to take care of the volume of business offering. A larger building was secured in Southampton, Ont., and the equipment from Toronto, together with some new machines, installed there. The head office, however, remained in Toronto.

The Southampton operation is housed in a two-storey, rough cast concrete factory, with a floor space of 20,000 feet. The equipment, which is modern and up-to-date, is driven by a 50 h.p. steam engine. A partial list of machines in operation is as follows: Black Bros. taping machine, Jenkins-Falls veneer jointer, Capital veneer clipper, Francis hydraulic press, 30"x 60", and Perkins glue mixer and spreader. In addition, the following woodworking machines have been set up for core and general work: Jackson-Cochrane revolving clamp, Herzog self-feed jointer, American band saw, swing cut-off, single surfacer, American straight-edging and ripping saw, belt sander, double cut-off, and two and three drum sanders.

Cores Given Careful Attention

The straight cut cores are made from chestnut or basswood. About 100,000 feet of this material is usually carried in stock. A 4 compartment Sidman kiln was installed to dry the core stock. This material is roughed to length and then jointed on the American straight edging saw. The pieces are glued without any further correcting. The glueing is all done on the Jackson revolving clamp.

After the cores are removed from the clamp, they are straightened on the Herzog automatic jointer and then sized in the planer. Before the crossbanding is laid, they are run through the drum sander. This results in a core uniform in thickness as well as providing a good glueing surface.

The three-ply and small five-ply panels are laid in one operation. Two operations are performed in laying the larger fine ply pieces and the seven-ply stock. That means that the three-ply cores are glued up first, and, after drying, are surfaced in the drum sander. It is important that the cores be evenly sized to prevent the face veneers being cut through in the final sanding.

Special Drying Room

The glueing and press work is carried on in the usual manner. Three-ply cauls are used on all panels. These are kept clean and treated with lard oil so that the work will not adhere to the cauls. Retaining clamps are used and the built-up stock allowed to stand 24 hours under pressure.

The drying room was constructed to their own specifications, in which the heating coils are placed along the side walls near the bottom. As the forms are taken down each morning the panels are immediately piled between strips on sleighs and allowed to stand until the afternoon when they are moved, with the aid of a lift truck into the drying room. The temperature in this room, which is above the engine room, is controled by a Tag self operating temperature controller and is held at from 110 degrees to 115 degrees with 35% relative humidity. The temperature is registered by a hygrometer. Fresh air is drawn in from the outside by means of a wooden flue along the floor, from which it is conducted vertically by wooden

flues placed at intervals. The air is allowed to escape from these on a level slightly higher than the sleigh or platform loads of panels. The heavier moisture charged air is drawn off at the floor level, opposite the fresh air duct by means of a wooden flue connected to the dust collector system.

Standard Drying Times Used

It has been found by experience, and as the result of careful tests, that the surplus moisture in three-ply panels as thick as ¼" is removed in 24 hours, while 48 hours is required to dry all five-ply stock. This time is ample because the stock is all redried before glueing. One advantage of a veneer drying room in which the temperature and humidity are kept constand is that definite drying times can be established, and when once adopted, very few tests for moisture are necessary.

Circulation, however, is of the utmost importance, for unless an adequate movement of air is maintained, the piles or truck loads of panels will not dry evenly, with the result that some of the pieces in the centre of the piles will contain too much moisture and perhaps cause trouble at a later date. Thus it will be seen that the movement of air must be positive enough to carry the moisture from the centre as well as the surface panels. When the direction air movement is ascertained, the piles should be so placed that the stickers do not retard the flow of warm air. After being dried, the panels are sized on the double cut-off and finished on the drum and belt sanders.

Home-made Redrier

The redrier, which was built to their own design, consists of a series of metal platens placed in heavy corner posts, in a horizontal position and heated with live steam. On each side of the hot platens are wooden platens which are opened and closed as required by means of eccentrics placed on shafting and controlled by means of levers. Each set is independent of any other set, therefore as soon as veneer is placed pressure can be applied and the next set emptied and refilled. There is no time lost as the veneer in the first set of platens is ready to come out by the time the last set is filled. The veneer comes out dry and flat and without checks, as the pressure is regulated.

About 3,000 feet of panels are turned out each day. This output is made up of stock in Mahogany, walnut,

View showing Black Bros. taping machine, Jenkins Falls veneer jointer and a buzz planer.

Planer and Jackson Cochrane jointer in Southampton plant.

plain and quartered oak, plain and quartered gum, birch, etc., for phonograph and furniture factories, and sash, door and general woodworkers.

The personnel of Panels, Limited, Toronto, is as follows: J. A. Houde, president; H. T. Brewitt, treasurer; W. A. Dugit, secretary, and R. C. Stock, superintendent in charge of the Southampton plant.

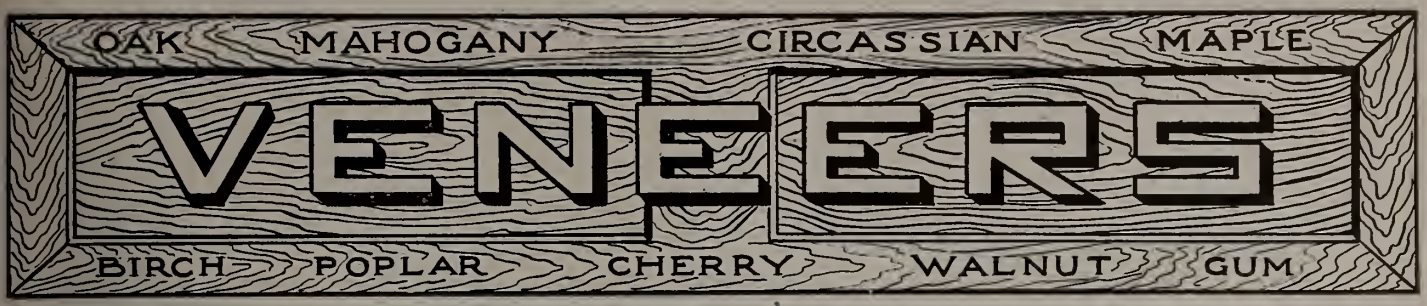
Box Manufacturers Form Section

Arising out of the work of the Tariff Commission the Canadian Manufacturers' Association decided to perfect their organization by the formation of sections of members belonging to various trades and industries. The Montreal branch, on January 10th, formed the Wooden Box Manufacturers' Section, this being decided at a meeting held at the Board of Trade, Montreal. The object of these sections is to secure interchange of opinion among the members and coordinate action in reference to such questions as the tariff.

Mr. N. P. Martin, of Martin Freres, was unanimously elected chairman, with Mr. Stewart F. Rutherford as vice-chairman. Others present at the inaugural meeting were: C. N. Dickson, Dominion Box & Package Co.; J. W. Thomas, Meyer-Thomas Co., Ltd.; J. N. G. Torrier, Hogue, Ltd.; R. A. Atken, G. & J. Esplin, Ltd.; Chas. Booth, Martin Freres; T. J. Pariseau, Pariseau, Ltd. A vote of thanks was passed to Mr. Rutherford for his work in preparing a brief for presentation to the Tariff Commission, and arrangements were made for regular meetings of the section.

Grinding Wheels for Saw Sharpeners

If the best results in the re-sharpening of the various types of saws by machine are to be secured it is highly important that wheels of suitable grade, grit and thickness be used. In a general way, wheels require to be on the soft side, so as not to overheat the saw tooth; and in order to impart a fine cutting edge, only a light cut should be taken over the tooth profile. The thickness of the wheels should, as a rule, not exceed one-third of the pitch of the tooth being ground. When ordering grinding wheels it should explicitly be stated for what kind of saws they are required, the width and number of teeth per inch, and whether the saws are tempered hard or soft.



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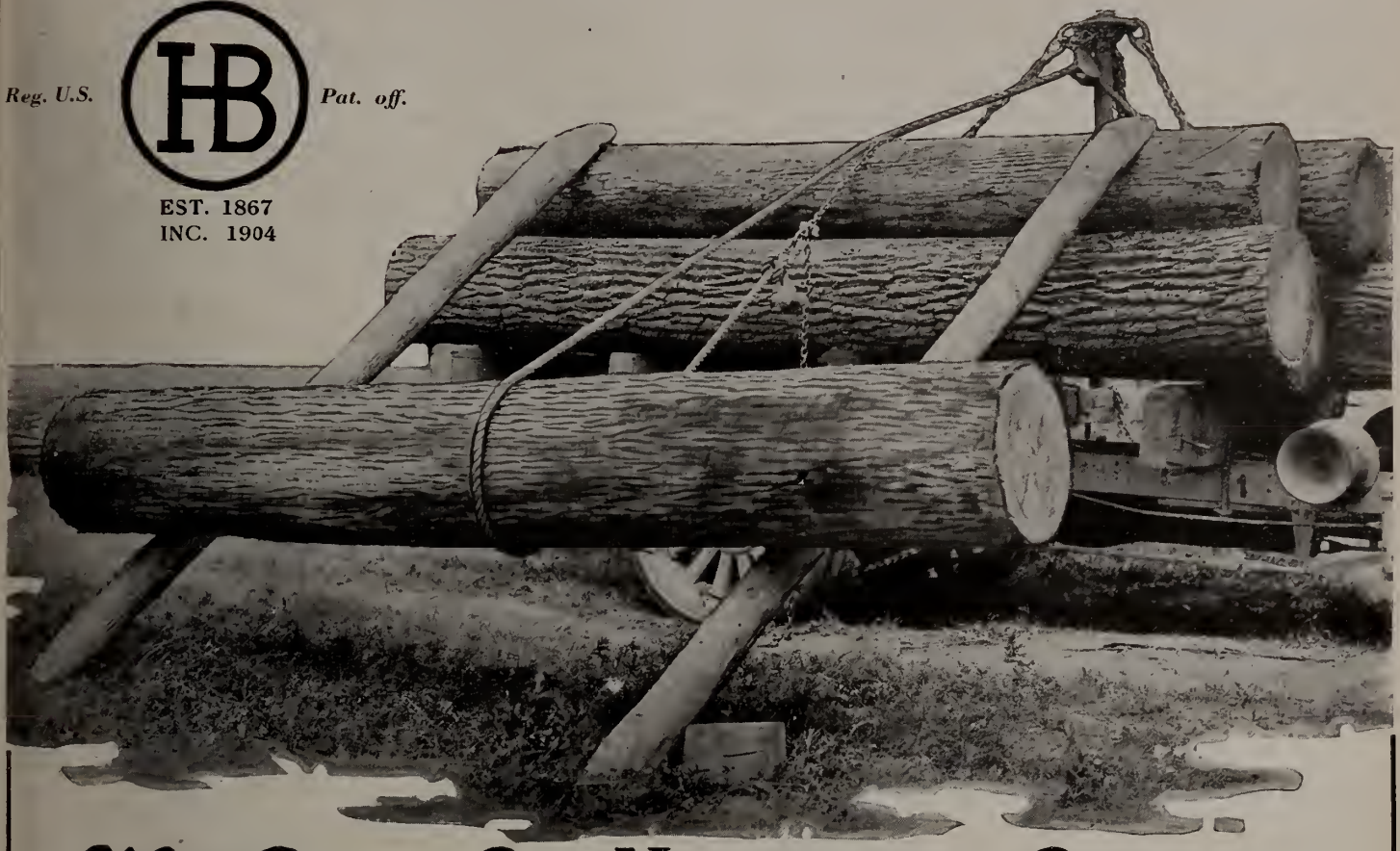

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Lumber

Plain and Fancy

VENEERS

Mahogany, Walnut
Birch, Ash, Poplar

Rotary, Sliced or Sawed in all Thicknesses

Built up Stock in
Birch and Maple

Send for Samples

George Kersley

Office: 511 St. Catherine Street West, Montreal.
Yard: 140 Chatham St, Montreal.

QUALITY *SERVICE*

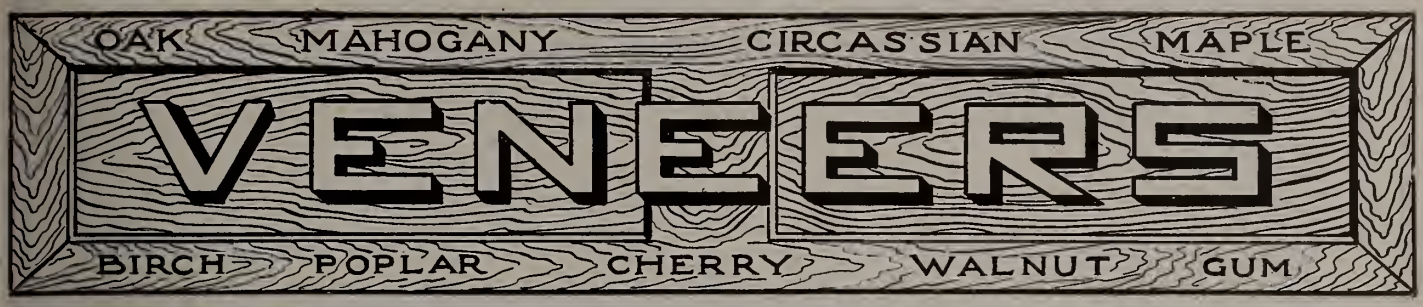
PICKREL VENEER COMPANY, Inc.

MANUFACTURERS OF

American Walnut

Exclusively

Woodruff and River *New Albany, Ind.*



INVESTIGATE

P.-J. SERVICE

For high-grade rotary cut veneer, that is smooth and evenly cut and dried by mechanical means to any percentage of moisture desired.

We also operate large band mills where all kinds of southern hardwood lumber is cut from our own tract of timber in the very heart of the Saint Francis Basin District, Arkansas.

PENROD-JURDEN COMPANY

A Name that Should be on your Enquiry List for both Veneer and Lumber

Mills at Helena and Penjur, Ark. General Offices: Memphis, Tennessee.

Penrod Walnut and Veneer Co.

Kansas City, - Mo.

Exclusive Manufacturers American Walnut Lumber and Veneers

AMERICAN BLACK WALNUT LUMBER

3/8"	FAS	6-9¼"	wide,	8-16'	long	3,600'	12/4"	FAS	10" & up wide	"	1,735'
1/2	"	"		"		20,902	16/4	"	"	"	2,180
5/8	"	"		"		26,330	3/8"	FAS	6" & up wide,	6/7' long	1,290'
3/4	"	"		"		25,962	1/2	"	"	"	5,790
4/4	"	"		"		72,502	5/8	"	"	"	840
5/4	"	"		"		16,766	3/4	"	"	"	8,940
6/4	"	"		"		39,201	4/4	"	"	"	21,040
8/4	"	"		"		23,140	5/4	"	"	"	2,400
10/4	"	"		"		14,245	6/4	"	"	"	7,807
12/4	"	"		"		4,130	8/4	"	"	"	1,200
16/4	"	"		"		1,180	10/4	"	"	"	1,200
1/2"	FAS	10"	& up	wide	"	9,680'	12/4	"	"	"	240
5/8	"	"			"	10,980	16/4	"	"	"	250
3/4	"	"			"	14,830	4/4"	Selects			36,935'
4/4	"	"			"	28,873	5/4	"			26,462
5/4	"	"			"	14,165	6/4	"			25,437
6/4	"	"			"	10,262	8/4	"			38,560
8/4	"	"			"	11,920	10/4	"			3,100
10/4	"	"			"	5,250					

3/8"	No. 1	Common			9,216'
1/2	"				29,410
5/8	"				16,815
3/4	"				31,285
4/4	"				79,030
5/4	"				49,412
6/4	"				22,710
8/4	"				37,380
10/4	"				600
12/4	"				315
16/4	"				420
1/2"	No. 2	Common			1,910'
5/8	"				4,200
3/4	"				2,190
4/4	"				70,560
5/4	"				41,893
6/4	"				30,727
8/4	"				40,170
10/4	"				1,687

Write for prices on any items you are interested in *"PENROD SERVICE" Satisfies*

C. A. Rugg, 115 Foots Avenue, Jamestown, N. Y., Eastern Representative.

Geo. C. Hall, 610 South Michigan St., Representative for Chicago and Michigan territory.

THE WILLIAMSON VENEER CO.

WALNUT BUTTS
MAHOGANY
LONG WALNUT
OAK · POPLAR
&
OTHER FANCY
WOOD VENEERS

BRANCH OFFICES
JAMESTOWN N. Y.
NEW YORK CITY FORTY-FIRST ST. & SIXTH AVE.

MILLS
BALTIMORE, MD.

AND SHOW-ROOMS
HIGH POINT, N. C.
28 E. JACKSON BOULEVARD- CHICAGO, ILL.

Buy now
what you need
as you need it.

Prices right
for dependable stock
and reliable service.

Three plants —
warehouse well stocked —
connections with eight
railroads.

We specialize in
L.C.L. deliveries.

THE *Evansville Veneer Co.*
MANUFACTURERS OF
VENEERS.
EVANSVILLE, IND.

Soldiers and Sailors Memorial Coliseum, Evansville, Indiana.

New Field for Panels and Plywood

Why Not Built-up Panels of Standard Sizes to Compete With Wallboards? —Advantages of Built-up Stock for Walls—Opens Up Large Market With Untold Possibilisies

By H. W. Marsh*

"There are some fields for the sale of medium grade, three-ply panels, in 3/16 and ¼ inch thicknesses, which have been neglected by panel manufacturers, probably because the proposition seemed too large to be successfully handled by any one house; but I believe that a combination of manufacturers could easily arrange for the sale of such stock and create a market that would afford long runs of strictly standard material, which could be profitably used as fill-ins when regular orders were slack, and the wheels kept turning during what would otherwise be dull times. Also an outlet would be afforded for millions of feet of veneers and much raw material could be worked in that now goes to waste.

"The proposed line would consist of laminated panels in standard sizes and thicknesses, sold at standard prices, which would compete successfully with the various brands of wallboards now being so extensively used. The small difference in cost between the wall-board and veneered wooden panels would be immaterial with the average ultimate consumer, once his attention was called to the superiority of the veneered goods in appearance, durability and upkeep.

Introduction of Fir Panels

"The Wheeler-Osgood Company, of Tacoma, Wash., is marketing a line of fir panels with success, which goes to prove the practicability of the plan I suggest. This company has issued a little booklet showing the advantages of fir panels for interior trim and how easily and cheaply they may be applied. Prices are quoted on thirteen widths and six lengths (a variety covering practically all needs). These fir panels are being used very generally in the bungalow type of houses in vogue in that section and that they are as standard there, 'as 1-inch oak is here.' This market is being rapidly extended. I see advertisements of 'wood' fir panels by Chicago and St. Louis houses and understand that they are gaining quite a foothold in the east. Fir is not the only handsome wood in the world and why shouldn't central and eastern panel manufacturers have some of this business?

"The initial difference in cost would be the only difference in the expense of using veneered panels and wallboard; it would cost practically the same for installation and finish, and the finish on the wood would improve with time, while that of the wallboard would deteriorate. The wood panels are vastly superior in appearance and there are few ultimate consumers who would not prefer a real wood finish when it could be secured at small extra expense.

Possibilities of the Demand

"In talking this matter over with a practical architect, he thought the plan was full of possibilities and cited some of the modern apartment houses, where it was desired to give as classy a finish as possible with the least expense. He suggested that, with the number of this class of buildings being erected, they alone would afford a considerable market.

"Thousands of stores all over the country have occasion to erect partitions that are more or less permanent. If you want a demonstration, just step into any of the piano, phonograph departments or clothing stores. By the time these partitions are properly decorated, if they are made of wallboard their cost is likely to exceed that of veneered panels and they require frequent redecorating, whereas the laminated panel would only need a rubbing over.

"The street car company in Indianapolis recently purchased several new cars, the vestibules of which were lined with wallboard. The cars have been in service only a few weeks, yet several of them have holes kicked through the wallboard. We all know that while veneered panels might be badly scratched up by a careless motorman's foot, it would require considerably more kick than the average motorman possesses to make a hole through a three-ply veneered panel. With anything having the initial cost of a street car, the extra expense of using the veneered panel would have been immaterial. Why was wallboard used? Wasn't somebody asleep at the switch? There are a thousand other uses for stock veneered panels; it is only necessary to make them easy to get and show how easily they may be installed to establish a tremendous market.

How Trade Could Be Handled

"It would probably be best for a combination of panel manufacturers to establish a central office where plans and publicity could be taken care of. Specifications and prices would have to be established and enough standard stock manufactured to insure the quick filling of orders. At first it is likely that orders as received would be apportioned to the mills and shipped from their warehouses, but if the proposition were properly pushed it would be only a short time until builders' supply houses and mail order houses would be carrying stocks of the veneered panels, just as they are now carrying the wallboards.

"Wallboard advertising has been both extensive and intensive. You can scarcely pick up a popular magazine without having the advantages of wallboard placed before you. Here is a builders' journal that carries three full page advertisements for three different brands of wallboard. The introductory work has been done; the public has been educated up to the inexpensive, quickly-applied wall covering or partition, and it is only necessary to show the vast superiority of the veneered panel to create a strong demand for it.

We are short a million homes already and the shortage is becoming more acute every day. Some of these days building will take a spurt, in spite of what material and labor may cost and 'quick delivery' will be the watchword with dwellings. Readily accessible stocks of veneered panels for interior finish that can be quickly and cheaply installed by any carpenter, or any man with a little mechanical ability, will be in big demand if they are where the people can get them. Isn't the matter worthy of serious consideration?

*Editor, "Veneers," Indianapolis. Address before Veneer and Panel Manufacturers' Association, Chicago, Ill.

Lumber Log Yard Showing Large Travelling Derrick

A Perfect Organization

A man is most skilled in that part in which he has been trained. So in manufacturing our hardwood lumber and veneers we first select the precise character of logs which will make the best finished product, and then divert each class of logs to a mill designed for a specific purpose.

We have four band mills and three veneer mills manufacturing the highest obtainable in quartered and plain white oak lumber, sawed quartered oak veneers, walnut lumber and sliced, rotary cut walnut veneers, rotary cut yellow poplar crossbanding, and a general line of high-grade southern hardwoods. This product is supplied by a service complete in all its details.

WOOD-MOSAIC COMPANY, Inc.
LOUISVILLE, KENTUCKY

General View of Sawmill, Dry Kilns and Lumber Yards, Louisville Plant

Publicity To Be Given Veneers and Plywood

At the annual meeting of the National Veneer and Panel Manufacturers' Association held recently, in Chicago, two very important projects were discussed and favorably acted upon. The first was that the Association undertake trade extention work through collective advertising. The second that the Association undertake to provide for official inspection of veneer and panel, and thereby afford a means of settling disputes between manufacturer and buyer, Both of these projects, and particularly the collective advertising plan, were enthusiastically received and unanimously approved by all present at the meeting.

Many large industries have undertaken trade extension work, which means advertising. The unquestioned intrinsic merit of plywood and veneer will make advertising in our line particularly effective. It is also true that the great majority of people are utterly ignorant of veneer and plywood and their advantages. The average person is under the impression that solid furniture, for instance, is the best furniture. Whereas, the well informed person knows that veneered furniture is stronger, more durable, and more beautiful and that the best furniture is now being made of plywood. Veneer and plywoods up to the time of the war were looked upon largely as decorative agencies. The war and subsequent research work, have demonstrated the value of plywood as a structural material.

Up to the present moment the advantages of veneer and plywood have never been advertised. The industry, like Topsy, has "just growed." Intelligent advertising will increase the demand for plywood immensely and intelligent advertising will increase the demand for plywood which have heretofore escaped notice. Such trade extension work cannot be undertaken by the individual, it must be collective. The National Veneer and Panel Manufacturers' Association affords the means of bringing about co-operation along this line, and it is up to you, and every other veneer and panel manufacturer, to get behind the proposition and push for all you are worth.

Necessarily, plywood must take the predominant place in all advertising, because plywood is the finished product which must be sold, but every foot of plywood for which a new market is found means a new market for from three to five feet of veneer. Therefore, the plan is to bring into this work, not only plywood manufacturers, but veneer manufacturers, glue manufacturers, abrasive manufacturers, machinery manufacturers, and everyone whose business will be helped by an increased demand for plywood.

As a result of the action taken at the Chicago meeting, a committee was appointed with power to go ahead and finance and put through both propositions. This Committee got together before leaving Chicago and preliminary plans were made and the Committee was organized as follows: J. T. Horne, General Chairman, H. S. Young, General Secretary, E. V. Knight, Chairman Finance, G. O. Worland, Chairman Trade Extension, C. B. Allen, Chairman Inspection, E. E. Hemingway.

The following gentlemen were unanimously chosen to serve as officials during the ensuing year: President, J. T. Horne, J. T. Horne Veneer Co., Tuscaloosa, Ala. First vice-president, N. M. Willson, Pearl City Veneer Co., Jamestown, N. Y. Second vice president, O. C. Lemke, Underwood Veneer Co., Wausau, Wis. Third vice president, H. J. Barnard, Central Veneer Co., Indianapolis, Ind., treasurer, E. H. Defebaugh, Chicago, Secretary, Howard S. Young, Indianapolis, Ind.

Comparison of different glues, Forests Products Laboratory

Particular compared	Animal glue	Casein glue	Vegetable glue	blood glue	Liquid glue
Source	Hides, bones, horns, etc.	Casein from milk	Cassava starch	Dried blood	Animal glue or fish parts
Cost per lb. 1920	25-42 cents	16-20 cents	10-12 cents	20 cents	$1-$5 per gal.
Spread in sq. ft. per lb.	25-35	35-55	35-50	30-100	No data
How mixed	Soaked in water and melted	Mixed cold with rapid stirring	Mixed with alkali and cold or hot water	Mixed cold	No preparation
How applied	Warm with brush or mechanical spreader	Cold with brush or mechanical spreader	Cold with mechanical spreader, not by hand	Cold with brush or mechanical spreader	Cold or warm usually applied by hand
Temperature of press	Cold, or with hot cauls	Cold	Cold	Hot	Cold
Strength (in shear test)	High grades stronger than strongest woods	Equal to medium grade animal glue	Equal to medium grade animal glue	High strength in plywood. Not used for joint work	Best grades equal to medium grade animal glue
Water resistance	Low	High	Low	High	Low
Chief uses in woodworking	For strong joint work	For water resistant plywood or joint work	For veneer work because of cheapness	For water resistant veneers	For repair work and small articles

Removing Stains From Veneered Work

Manufacturers of veneered products find that certain of the waterproof glues on the market show a tendency to stain through the thin face veneer. The thinner the face stock, the more noticeable this tendency. With veneer thicker than 1/28 in., this trouble is seldom experienced. With 1/28 in. stock, if the glue is spread thinly and the stock removed from the press or retaining clamps in about 2½ hours from the time the glue was applied, it will be found that the tendency to stain has largely been overcome.

This staining is due to the lime contained in these glues. The manufacturers of waterproof casein glues are striving to overcome this objectionable feature. In an experimental way they have been successful. This difficulty will, probably, be eliminated in the glues of the near future.

Stains of this kind may be removed, or rendered inconspicuous, by an application of a 10 or 15 per cent. solution of oxalic acid. The same applies to joint work. By sanding the joint and then applying the above solution, then sanding lightly, the glue or joint lime will be rendered invisible.—J. C. H.

A proper band-saw guide tends to save the saws from crystallizing and breaking.

The emery wheel may be used to make a pretty color scheme on the back of a knife, but it does not improve the temper.

The temper in different band-saw blades varies. This should be considered when putting in tension.

Large stocks always on hand for prompt shipment.

We carry in stock for immediate shipment 3 and 5 ply panels in Birch, Oak and Mahogany.

Sizes 24 and 30 inches wide; 48, 60 and 70 inches long.

Let us quote on your panel requirements.

SAMPLES SENT ON REQUEST

TORONTO VENEER CO. LIMITED

Importers and Dealers
1100-1104 Queen St. West, TORONTO, ONT., CANADA

Walnut, Quartered White Oak and Mahogany Veneers and Lumber

Prompt Delivery

LONG-KNIGHT LUMBER COMPANY
INDIANAPOLIS, IND.

Can Present Lumber Values Last Indefinitely?

Are Woodworkers Overlooking Good Bet?—Lumber Production Away Down and Stocks Dwindling—Stabilization Benefit to All

By L. R. Wright

Have you placed orders covering your lumber requirements for the next six months? I want to repeat the suggestion made in the December "Canadian Woodworker" that now is the opportune time to cover your requirements. The manufacturer, who buys lumber at current values, cannot sustain a loss. Prices cannot go lower, they have reached rock bottom. The next movement will be upward and it is likely that quotations will show some such reaction in the near future.

Lumber, to-day, can be purchased below cost of production, in many instances below its intrinsic value. Such a condition cannot last indefinitely. Some lines are selling as much as 30 and 35 per cent. below replacement costs. It may be suggested that production costs are too high. They are, and are bound to come down. Greatly increased efficiency on the part of labor in the woods and mills and a lowering of the prevailing wage scales, will not bring costs down to where lumber can be sold, profitably, at present rates. The lumber manufacturer must show a profit on his operations and as soon as the demand strengthens, will find it imperative to increase prices to cover operating expenses. **Conditions so favorable to lumber buyers, cannot last indefinitely.**

The lumber manufacturer, to protect himself and his interests, has been forced to close down. Thus we find that fully 75 per cent. of the lumber operators in the United States have stopped cutting for indefinite periods. Many have withdrawn their equipment from the woods and stopped the input of logs. A careful survey of the situation in the different producing centres was made, recently, by an authority, and his estimate was that the amount of lumber being cut is 13 per cent. of normal in the southern areas producing oak, walnut, gum, etc., and 16 per cent. of normal in the northern centres cutting birch, beech, maple, etc. These figures cannot help but give food for thought, especially when coupled with the facts that stocks on hand are well below the quantities normally held at this season of the year, and the small stocks available are being gradually reduced by small orders.

The general attitude of those lumber manufacturers who have ceased operations, is that they will keep their plants idle until some improvement is shown, sufficient to enable them to produce at a profit. As production costs have dropped and are likely to go still lower, it is anticipated that a comparative low level of values will prevail, provided there is not a rush to cover on the part of a large number of lumber users. Such a feature would undoubtedly result in a sharp rise in prices and a scramble for stock.

Should an "Auction" market prevail this spring, and many think it will, the woodworker, who stayed out of the market, will have only himself to blame when he finds he is forced to pay a stiff price for the material he needs. Apart from the fact that any who buy now will save money, if all woodworkers who find their lumber stocks running low, were to enter the market it would tend to stimulate the production of lumber, assist in stabilizing lumber values and react favorably on their own industry.

Conditions in both Canadian and American markets have not shown very much improvement. A few sorting-up orders are being placed but buying is not general. The one bright feature is that more enquiries for stock and prices are being made and that these have every appearance of being bona fide, that is, sent in by woodworkers who are desirous of buying. It is anticipated that the next month will see a resumption of buying on a gradually increasing scale.

Large Lumber Manufacturer Closes Plants

The W. M. Ritter Lumber Co., Columbus, Ohio, one of the largest, if not the largest, lumbering manufacturing company in the United States, have closed down all their saw and planing mills for an indefinite period. In this connection they have this to say. "While our stocks on hand are only approximately normal and while we are aware of the belief on the part of a very large number of business people that there will be a steadily improved demand for hardwood lumber after the first of the year and the belief on the part of some that one need not be surprised to see, in the future more or less distant, a renewal of auction market conditions, which was in evidence last year and which the present policy of buyers invites or certainly tends to produce, we think the present situation in respect to the cost of production and sales prices is such that it is the part of wisdom to suspend production until the market sufficiently improves to justify resumption."

Large Commercial Forests in Brazil

One of the world's greatest needs at the present time is timber of almost every description. In view of this fact the lumber resources of Brazil are of considerable interest, especially as many varieties of hardwoods, used in the manufacture of furniture of the better grades and for hardwood floors, doors and other joinery work, are available in great quantities. On the numerous plateaux of the southern states extensive pine forests exist, and large quantities of logs and planking are being sent from these forests to the Argentine and Uurguay. The development of the lumber industry of Brazil will depend largely on improvement of the railway and inland waterway transportation facilities of the country. It is estimated that the forests of Brazil are sufficient to supply the needs of the world for several centuries. There are localities in the states of Bahia, Espirito Santo, Santa Catherina, Parana, Rio de Janeiro and Sao Paulo, where the felling of trees has been going on for some time, and large quantities of hardwoods have been shipped to America and Europe; but the time has undoubtedly come when this trade should be increased, especially in view of the constantly increasing demands for lumber, both in the United States, Canada and in Europe.

It often happens that a small outlay of a few dollars will save hundreds in the course of a year.

Leland G. Banning
CINCINNATI, OHIO

Send Us Your Orders

For

Soft Texture

Mountain Poplar

and

Northern Oak

1 to 4″ thick, any grade. Can ship immediately.

3 PLY **VENEERED PANELS** 5 PLY

In

Maple, Elm,
Birch,
Walnut, Mahogany,
Plain Oak,
Quartered Oak,
etc., etc.

For

Drawer Fronts,
Drawer Bottoms,
Desk Tops, Table Tops,
Door Panels,
Interior Woodwork,
Sewing Machine
Woodwork, etc., etc.

HAY & CO., Ltd., Woodstock, Ont.

Big Demand for Fir Furniture in B.C.

"Western Products for Western People" is the motto of Mr. T. E. Dowling, head of the Dowling Manufacturing Co., Vancouver, B.C., who is specializing in the manufacturing of bedroom and kitchen furniture of British Columbia fir. Mr. Dowling, who spent seven years with the David Spencer Co. as manager of their furniture department, realized the great future possibilities in this local wood, and after some years of experimentation and endeavor has succeeded in producing medium-priced fir furniture with a finish considered impossible a few years ago.

The products of this company are, as yet, known only to the local market, but with the price of hardwood furniture resting on high levels, there is no reason why articles of B. C. fir should not gain favor with the whole of this country. When fir furniture first came on the market no serious effort was made to produce a fine finish and on account of the surface roughness and lack of care in manufacturing it was not considered favorably by the general public. The Dowling Manufacturing Co. have, however, overcome that prejudice by the truly wonderful results they have obtained with their fumed and golden oak finishes. They specialize in bedroom furniture and the fumed finish is in great demand for this class of furnishings.

Fir is liable to quite an amount of shrinkage and swelling, as anyone who has tried to open a swollen dresser can testify, but that disadvantage is overcome by the Dowling Co. by means of overlapping edges which not only provide for the peculiarities of the wood but make a dust-proof seal. Bevelled plate mirror glass is used for the dressing tables and chiffoniers and simplicity of design and sturdiness of construction mark their manufacture throughout. Wonderful effects in graining are obtained by exceptional care in matching the wood and especially in the golden oak finish is this care evident.

A Beloit No. 1 cut-off saw, a Hallman Penniston joiner, a Crescent pony planer, and a combination saw and shaper are included in the equipment of this factory. Plans for further extension of the building and machinery are now under way. The field for sturdy, artistic, medium-priced furniture is practically unlimited and as recent methods in producing fir furniture have shown what excellent results can be obtained from this wood, the production and use of British Columbia fir should show great expansion.

Large Handle Manufacturing Concern

One of the largest hickory handle manufacturing organizations is described in a well-known publication as follows:

The Turner, Day & Woolworth Handle Company, is successor to the Turner & Day Company, which was organized in 1854 and began the manufacture of handles in Norwich, Conn. The main factory and offices are now located in Louisville, but there are other large factories at Memphis, Cairo, Nashville, Poteau, Okla., and Paragould, Ark. In addition to these large factories there are about twenty-five smaller factories located in Kentucky, Tennessee, Mississippi, Texas, Arkansas and Illinois. It has been the endeavor of this company to locate these small factories in the best hickory timber sections of the several states mentioned.

The Turner, Day & Woolworth Handle Company manufacture all varieties of hickory handles for hatchet and hammer manufacturers, edged tool manufacturers, and railroad, coal and other mining companies. Some idea of its extensive business is conveyed by the fact that the company manufactures over 2,000 different kinds of handles. Over one-third of the total products of this concern are shipped to Europe, Asia, South America and other foreign countries. The trade mark —"We Handle the World"—is peculiarly appropriate and well chosen. Over 40 per cent. of all the hickory handles used in the world are manufactured by the Turner, Day & Woolworth Handle Company. There are at present over 1,500 men employed by this organization and its annual payroll runs well over $750,000.

Melted Wood! What Next?

It is possible to melt wood by heating it in a vacuum, producing a hard, homogeneous substance. Melted wood was for a long time only a laboratory curiosity, but it may be that industry shall presently discover practical applications of the greatest interest.

Now although wood is eminently inflammable it melts at a relatively low temperature, but in very precise conditions, and only when it is absolutely removed from contact with oxygen so that its combustion is impossible. This may be understood when we remember what its composition is. When its immediately soluble constituents have been removed, by means of alcohol, for instance, it gives on analysis organic acids, water, oily essences, silcates, sulphates, phosphates, chlorides, and hydrocarbonates of lime, potash, soda and magnesia, carbonic acid, carbonated hydrogen, etc.—that is to say, solely bodies susceptible of being evaporated or dissolved after having co-operated by chemical affinity in the formation of determinate substances.

Starting from these data Messrs. Bizouard and Lenoir, in 1891, studied the problem of the fusion of wood. They operated in a closed vessel at a relatively low temperature—that is about all one can gather from the records of the period.

Their work was taken up by others, and now there is a full operative technic that enables us easily to obtain excellent results. A metal receiver, a sort of boiler having a double bottom through which superheated steam passes, is filled with bits of wood. It is closed by a lid similar to that used in autoclaves and provided with an apparatus for exhausting the air. When the wood thus kept in a vacuum is heated above 284 degrees Fahrenheit the water and other volatile substances are given off first and are drawn off by means of the exhausting apparatus, after which the heating is continued for about three hours. There then takes place a complex series of fire-actions and phenomena analogous to those that accompany the distillation of wood in a closed vessel, and in this way all the so-called pyrogenous products are separated; these in turn are drawn off, condensed and separated so that they may be utilized commercially. There then remain in the receptacle only the fibrous skeleton of the wood and the mineral salts, which taken altogether constitute a fusible mass. This is allowed to cool slowly, out of contact with the air, and then placed in a second boiler, which, after the air has been exhausted, is filled with nitrogen under a pressure of 1.5 to 2 atmospheres. The whole is heated to 1500 degrees Fahrenheit, for two hours, and at the end of this time the wood is melted into a homogeneous hard mass.

Canadian Hardwoods

Good Stocks
Right Grades
Prompt Shipments

:: Members National Hardwood Lumber Association :

Crating
of all descriptions

C. A. Spencer, Limited
Merchants and Manufacturers
McGILL BUILDING - MONTREAL

Quite Often

you will find the very thing you are looking for in these advertising pages. It will pay you to read them.

Linseed Oil has its best equivalent in "FLAXICON." Either in boiled or raw, is elastic, durable and waterproof. Working to the best advantage with colors ground in oil.

Penfound Varnish Co.
CARIBOO AVE. - TORONTO

You may find below something you want in

Dry Hardwoods

30	M′	4/4″	No. 2 Com. & Btr. Birch
30	M′	6/4″	No. 2 Com. & Btr. Birch
30	M′	8/4″	No. 2 Com. & Btr. Birch
7½	M′	12/4″	No. 1 Com .& Btr. Birch
4½	M′	16/4″	No. 1 Com. & Btr. Birch
50	M′	4/4″	No. 3 Com. & Btr. Basswood
50	M′	5/4″	No. 2 Com. & Btr. Basswood
16	M′	8/4″	No. 3 Com. & Btr. Basswood
18	M′	8/4″	No. 2 Com. & Btr. Rock Elm
10	M′	8/4″	No. 2 Com. & Btr. Soft Elm
20	M′	12/4″	No. 1 Com. & Btr. Soft Elm

Stock --- Good Prices --- Right

Canadian General Lumber Company, Limited
712 Bank of Hamilton Bldg.
TORONTO
MONTREAL OFFICE: 203 McGill Bldg.

Selling
Graves, Bigwood & Co.'s
Lumber, Lath and Box Shooks

Information and Inquiries

You are cordially invited to make use of this department

Polishing Wax for Handles

East Wentworth, N. S., Dec. 28, 1920.

Editor, "Canadian Woodworker":—

Will you kindly furnish us with a reply to one of these three questions: The address of a manufacturer of wax finishing belts for fine handles, or the address of a manufacturer of suitable dressing for such belts or the formula for making a good wax for polishing handles.

Yours truly,

Maritime Handle Co., Limited.

Many handle manufacturers polish their handles on the glazed or cloth side of the sanding belts after the grit has been worn off. The wax used is a low grade of paraffin wax, which may be secured from any of the oil companies.

Wheels for Tea Wagons

Belleville, Ont., Dec. 27, 1920.

Editor, "Canadian Woodworker".—

Will you kindly inform me where I can secure wheels suitable for tea wagons. Thanking you in anticipation, I am,

Yours truly,

R. McPherson.

The large rubber-tired wheel for tea wagons may be secured from the Gendron Mfg. Co., Limited, Toronto, while the Faultless Caster Co., Evansville, Indiana, makes a suitable line of swivel wheels.

Here's a Poser

St. Anne Des Plaines, P.Q., Jan. 3, 1921.

Editor, "Canadian Woodworker":—

Could you tell how we can eliminate the trouble we have in placing the round iron shoes on a line of children's sleighs we are making? We experience considerable difficulty in this operation. Is there any machine on the market that is adapted for this work.

Sincerely yours,

Le Clerc & Beauchamp, Ltee.

We do not know of any machine built for this purpose. It is more than likely that each sleigh manufacturer has special equipment, which was built to his own specifications. If any readers of the "Canadian Woodworker" can furnish any information on this point their co-operation will be appreciated.

Rocking Chairs Wanted

A large firm of general suppliers in Trinidad, with a furniture department, desire to be put in touch with Canadian manufacturers of rocking chairs. If interested, write in, referring to inquiry No. 2626.

It has been suggested that if the air admitted to a dry kiln were to be taken from some warm place, it would help maintain the temperature in the kiln and conserve fuel.

Doors, Mouldings and Plywood Wanted

A firm of importers of timbers, doors, mouldings, plywood, etc., in Dunedin, N.Z., would like to get into communication with a firm of lumber exporters in Eastern Canada who are in a position to ship from Montreal or St. John. The following are the principal lines required: pine and spruce in planks, select and merchantable quality 12 by 2, 12 by 3, 9 by 2, and 9 by 3; doors and materials for making sashes and mouldings; 3-ply veneer in first and second quality in sheets 72 by 36 and 60 by 36, 1/8 inch and 3/16 inch thick, suitable for dado panelling; single-ply veneer for drawer bottoms. If possible, let the exporter quote for the above lines and state the rate of freight from port of shipment to Dunedin. The name of this firm will be furnished on application. Inquiry No. 2591.

Orange-box Shooks Wanted

The London England, branch of a South African bank has been requested by several of their clients in South Africa to endeavor to make arrangements for the regular supply from Canada of box shooks for orange cases, and invite quotations by cable for 10,000 to 20,000 cases according to the following specifications:

Parts	Length Inches	Width Inches	Thickness Inches
3 inches	11½	11½	1
4 pieces	26	5½	¼
4 pieces	26	5¼	¼
2 cleats	11	1	½

Wood to be the usual quality of pine or other white wood, and the cases to be made up in shooks, bound with wire. Owing to Government regulations, it is necessary that the various pieces are cut to exact size. Quotations to be c.i.f. Cape Town, and date of delivery to be stated. If interested write the publishers of this paper, referring to inquiry No. 2654.

Doors and Dowels Wanted

A manufacturers' agency in London, England, desire to arrange to represent manufacturers of doors and dowels. They ask for sole selling rights in the United Kingdom, and are in touch with importers in the United Kingdom who will give very large orders if satisfactory prices can be arranged. For further information refer to inquiry No. 2790.

Want Furniture for Export

A large firm of travelling agents with headquarters in Trinidad and branch in British Guiana wish to obtain a Canadian connection for low grade furniture, especially cheap furniture and rockers. Refer to inquiry No. 2645.

Many of the special automatic lathes on the market would be found useful for utilizing the wood waste which accumulates in many plants.

While an electric motor will run in a department that is dirty and dusty, it will give better service if installed in a cool, clean place.

There are a great many kinds of different belt fasteners, and each have special advantages for various kinds of belts.

The Season's Greetings
from
The Old South

ANDERSON-TULLY COMPANY

"Everything in Southern Hardwoods"

Memphis Tenn.

Stoltz & Williams
Chicago

News of the Trade

Danforth Sash Factory, 4 Palmer Ave., was recently registered in Toronto.

Reeves & Son, cabinet makers, were recently registered at Montreal, P.Q.

Boisse & Racicot, Sherbrooke, Que., contemplate the erection of a hardwood flooring plant.

T. M. Fox & Sons, Limited, Montreal, P.Q., were recently registered as manufacturers of glue.

S. Oakes, Strathroy, Ont., contemplates erecting a new planing mill and is in the market for some new equipment.

The Ideal Art Reed Mfg. Co. was recently registered in Montreal, P.Q., with John Fisk & Edwin Warren as partners.

Recent Montreal registrations include the Dawson & North Pattern & Metal Works and the Universal Pattern Works.

The Montreal Development Co., of St. John, N.B., have commenced work on the sixty bungalows they are erecting at Fairville, N.B.

The thirteenth annual meeting of the Canadian Lumbermen's Association was held recently at the Chateau Laurier, Ottawa.

Mason & Risch, Limited, Toronto, Ont., have been authorized by suplementary letters patent to increase their capital from $1,000,000 to $1,500,000.

The plant of the Universal Toy Co., Toronto, was damaged recently by fire. Both the building and contents suffered. This plant is operated by two returned soldiers.

The building permits issued in Kitchener for 1920 show an increase of $61,000 over those of the preceding year. The figures are $1,238,000 for 1920 as against $1,176,000 for 1919.

Keystone Transports, Limited, Montreal, P.Q., have been granted a federal charter of incorporation to manufacture and deal in ships, barges and other craft. Capital, $5,000.

In Toronto the building permits issued for 1920 show a value of $25,785,000, as against permits with a value of $19,819,000 for 1919, showing an increase of about $6,000,000 for 1920.

T. B. Spratt, manager of the Harbor Marine Shipyard, Victoria, B.C., states that his company contemplate dismantling their plant and disposing of the machinery and equipment.

The plant of the Scotia Woodworkers, Limited, Oxford, N.S., was recently damaged by fire. While the plant was not a total loss the damage amounts to $100,000. This is only partially covered by insurance.

Canadian Dolls, Limited, Grimsby, Ont., have been incorporated to manufacture and deal in dolls and all kinds of toys. Capital, $50,000. J. S. Christie, clerk, and G. B. McConachie, barrister, both of Grimsby, Ont.

J. Stanley Wedlock, Charlottetown, P.E.I., has secured a large stand of birch and is planning on equipping a cheese-box factory. He figures on an output that will take care of the requirements of the Maritime Province trade.

The Sheperdson Building Co., of New Liskeard, Ont., who have been manufacturing ice cream tubs and cabinets, are branching out and adding box and wash-boards to their line. To this end they are opening a new box factory.

The Clothespin Factory at Orillia, Ont., formerly conducted by the late J. G. Stephenson, is being offered for sale. The equipment consists of one swing shingle saw, cut-off saw, sticker, rumbler and a small amount of equipment.

J. Coughlan & Sons, Limited, Vancouver, B.C., have re-opened their shipyard with a large force of men, numbering approximately 1,000. The freight steamers of 1,300 tons each, are being constructed at a cost of about $3,000,000.

Many of the large Ottawa woodworking firms are closing down, some for an indefinite period. About 300 employees will be out of work. It is stated that one of the largest of these concerns will re-open again on February 1st.

The by-law, recently voted on, granting certain privileges to the Oakville Basket & Veneer Co., was not carried owing to the fact that it did not receive the necessary two-thirds maority. The vote was 258 for and 131 against the by-law.

The Reynolds Machine Co., Massillon Ohio, manufacturers of automatic screw-driving machinery, have announced that they are making material reductions in the prices of their line of equipment, the new prices taking effect as from January 3rd, 1921.

Fromson Company of Canada, Limited, Montreal, were recently granted a federal charter to manufacture and deal in gramaphones and cabinets. Capital, $100,000. P. Bercovitch, K.C., and R. L. Calder, both of Montreal, are two of the incorporators.

Laiterie Ferme Saraguay, Limitee, Montreal, P.Q., have been granted a provincial charter to manufacture and deal in stoppers, boxes and other wooden products. Capital, $50,000. H. Grou and J. A. Grou, both of Montreal, are two of the incorporators.

Montreal Motors Corporation, Limited, Montreal, P.Q., have been incorporated to manufacture and deal in automobiles, carriages and other wooden vehicles. Capital, $99,000. J. M. Larocque and J. Larocque, both of Montreal, are two of the incorporators.

Tippet & Co., Limited, Montreal, P.Q., were recently incorporated to manufacture and deal in toys, musical instruments and all kinds of furniture. Capital, $15,000. H. N. Chauvin, K.C., and H. E. Walker, both of Montreal, are two of the incorporators.

E. S. Bryant Pattern Works, Limited, Windsor, Ont., were recently granted a provincial charter to manufacture and deal in wood and metal patterns. Capital, $40,000. E. S. Bryant and E. J. Manner, both of Detroit, Mich., are two of the incorporators.

A company known as the Dion Knife Co., Vancouver, B.C., has been formed to manufacture thin high speed and inlaid planer and moulder knives. Mr. Dixon, the organizer of this company, has had considerable experience in the manufacture of knives.

The Liverpool Woodworking Co., Limited, Liverpool, N.S., who conduct a general woodworking business, are branching out and adding a line of oak mantels. Other lines produced include wood ships, blocks, mast hoops and small boats and dories.

J. G. McGuire, Limited, Ottawa, Ont., have recently been incorporated to manufacture and deal in automobiles, trucks, carriages and other wooden vehicles. Capital $60,000. J. G. McGuire and C. F. Gervan, both of Ottawa, Ont., are two of the incorporators.

The late John F. Dodge and Horace Dodge, of the well-known automobile manufacturing firm of Dodge Bros., each left an estate which is valued at approximately $55,000,000. The inheritance tax on these estates will run from $10,000,000 to $15,000,000 each.

Canadian Perfect Wheels, Limited, Listowel, Ont., have been granted a federal charter of incorporation to manufacture and deal in all kinds of wooden wheels. Capital, $100,000. Two of the incorporators are G. Melrose and M. K. Becker, both of Listowel, Ont.

Interprovinciale Ltee., St. Pie, P.Q., manufacturers and wholesale dealers in funeral equipment, are enlarging their plant. A two-storey addition, 145 ft. x 50 ft. and a number of smaller buildings are being added. This firm are in the market for considerable equipment.

Queen City Furniture Co., Limited, Toronto, Ont., have been granted a provincial charter to manufacture and deal in furniture, toys, dolls, boxes and other wooden products. Capital, $100,000. R. Shapiro and J. C. Fitzgerald, both of Toronto, are two of the incorporators.

McConnell & Ferguson, Limited, London, Ont., have been granted a federal charter to manufacture and deal in wooden boxes, cabinets and other wooden products. Capital, $400,000. Morley Smith and G. M. Huycke, barristers, both of Toronto, are among the incorporators.

A prize for locating the biggest tree in New York state has been awarded to Chas. J. Richards, editor of the "Gowanda News." The tree in question was an elm 34 ft. 2 in. in diameter at a height of 30 inches above the ground. The total heighth of the tree was well over 100 feet.

The Mount Forest Casket Co., Mount Forest, Ont., are making changes of a more or less extensive character in an endeavor to extend their business. A four-storey addition, 42 ft. x 80 ft., is being erected. This will increase the capacity of their plant and enable them to get out many new patterns.

Canadian Top and Body Corporation, Limited, Fort Erie, Ont., were recently granted a provincial charter to manufacture and deal in automobile bodies and tops. Capital,

Are you sure you haven't overpaid him?

He is paid on the basis of the time you have purchased from him. But how about his productive time? Can you check it up to make sure that it tallies with the hours he sold you? You should be able to and you would if you have an accurate system of Job Time Recording in your factory.

INTERNATIONAL
JOB TIME RECORDERS

installed in each department will give you an accurate, unchangeable and indisputable record of each employee's productive time. They will show you which are the profitable workers and which are the unprofitable.

And no intricate and unwieldy system is necessary. With Internationals these records are always available at a moment's notice and you can depend upon them. It's only another step to compare them with the time sheets and you have the facts

It is the knowledge of these facts that leads to greater profits for your business and meritorious pay envelopes for your employees.

No manufacturer can afford not to reduce to the lowest possible figures the difference between his purchased hours of labor and his productive hours of labor. It is an important item in the present-day scheme of industry.

Thousands of manufacturers are depending upon the infallible records of International Job Time Recorders. Let us prove to you that they would be indispensable in your factory too.

International Business Machines Co.

LIMITED

F. E. MUTTON, Vice-Presideut and General Manager

Head Office and Factory: 300-350 Campbell Avenue, Toronto

HALIFAX, 44 Granville St. ST. JOHN, 18 Germain St. QUEBEC, 506 Merger Bldg. MONTREAL, 1 and 3 Notre Dame St. OTTAWA, 190 Queen St. TORONTO, 409½ Yonge St. HAMILTON, 228 King St. E. LONDON, 489 Richmond St. WALKERVILLE, 44 Lincoln Rd. WINNIPEG, 227 McDermott Ave. VANCOUVER, 110 Water St.

Also manufacturers of Dayton Scales and Hollerith Electric Tabulators

$100,000. L. L. Odette, of Sandwich, Ont., and W. C. LaMarsh, barrister, of Chatham, Ont., are two of the incorporators.

The Canadian Loader & Body, Limited, Montreal, have been granted a federal charter to manufacture and deal in motor trucks and other vehicles and an apparatus called "loaders" for all kinds of vehicles. Capital $200,000. A. Salmon and D. B. Viger, both of Montreal, are two of the incirporators.

National Picture Frame and Art Company, Limited, Toronto, Ont., have been granted a federal charter to manufacture and deal in mouldings, picture frames and other wooden products. Capital, $100,000. Two of the incorporators are J. A. Macintosh, barrister, and D. A. Macintosh, both of Toronto.

The Office Specialty Mfg. Co., Limited, Newmarket, Ont., recently prepared an interesting chart showing the increased costs of the various materials entering into their line of office equipment. The information is shown in a comparative form, giving pre-war quotations as well. About 100 items are listed.

Manitoba Shipbuilding Corporation, a corporation in the state of Wisconsin, has been granted an extra provincial license to carry on business in Ontario and to build, purchase, sell, operate and repair ships, barges, dredges and vessels of all kinds. The company is authorized to spend the sum of $40,000 in the province.

Ryan & Hughes, Limited, Toronto, Ont., were recently granted a provincial charter to take over the business and interests of Ryan & Hughes, Toronto, and to manufacture and deal in clocks, pictures and all kinds of furniture. Capital, $100,000. T. L. Monohan and G. Keogh, barristers, both of Toronto, are two of the incorporators.

A provincial charter has been granted to the Pannill Door Co., Limited, Toronto, with a capital stock of $60,009. The company will take over the busines of the Pannill Door Co. and is empowered to manufacture, and deal in doors and sashes as well as conduct business of general woodworkers, contractors and lumber marchants.

The second and third floors of the factory of the Beck Manufacturing Company, Limited, cigar box manufacturers, Montreal, were considerably damaged by fire on January 7th. The blaze, which apparently started either in the flooring of the third floor or the ceiling of the second, burnt a hole through the ceiling a foot from a ton and a half press.

Pierre J. Le May & Cie., Limitee, Montreal, were recently granted a federal charter to take over the business formerly known as Pierre J. Le May & Cie., and to manufacture and deal in automobiles, carriages and other wooden vehicles. Capital, $49,000. W. P. McFeat, Westmount, P.Q., and G. G. Cooke, Outremont, P.Q., solicitors, are two of the incorporators.

H. Lovell & Sons, Limited, Coaticook, Que., have been granted a provincial charter to take over the real estate business of H. Lovell & Sons, and to conduct a general lumber business, manufacturing and dealing in chairs and other articles of furniture. Capital $250,000. Fritz E. Lovell, manufacturer, and A. J. Sparks, lumberman, both of Coaticook, are two of the incorporators.

Carriage Factories, Limited, Orillia, Ont., are devoting considerable attention to the manufacture of bodies for the different makes of motor trucks. This is in addition to bodies, open and closed, painted and trimmed complete for pleasure cars. The Orillia plant has been reorganized to handle these lines advantageously.

According to a report by Trade Commissioner Brady, the market for pianos in Argentina is very similar to that in the United States and Canada. 29 makes of pianos were noted on exhibition in different Buenos Ayres stores which were divided as follows: 7 German, 6 English, 2 French and 1 Spanish. This is a market to which the Canadian piano industry might devote more attention.

Maguire, Patterson & Palmer, Canada, Limited, who were recently incorporated under a federal charter, have been granted provincial papers, permitting them to carry on business in Ontario provided they do not use an amount of capital in excess of $1,000,000. E. A. Dunlop of Pembroke is the company's attorney. This is the company which is erecting the $5,000,000 match factory at Pembroke, Ont.

D. Fullerton & Son, Limited, Pictou, N.S., were recently incorporated to manufacture and deal in wood products of all kinds and to take over as a going concern the business known as "D. Fullerton & Son." The output of this going concern will be confined largely to sash and doors, although all kinds of building material will be worked up. F. Adamson is the president and A. A. Ferguson, vice-president.

Broughton Hardwood Products, Limited, Liverpool, N.S., recently installed an up-to-date dowel plant. The equipment includes three Fay & Egan dowel stickers, two Hawker adjustable-head dowel machines, two Yates self-feed band rip saws and two Ricker bolting machines. They are also installing a Dauber-Bell dowel machine to work up the waste. Their output will be confined entirely to the manufacture of dowels.

The annual meeting of the Halifax Shipyards, Limited, held recently, was presided over by their president, Mr. H. P. Smith. At the present time two ships are under construction and a large volume of repair work is on hand. It was further intimated that the company had in prospect orders for a number of large vessels. This work will be sufficient to keep the Halifax yards as well as those of the Davie Company at Levis and the Tidewater Company at Three Rivers, busy for a considerable period.

The United Growers Packages, Limited, Niagara-on-the-Lake, Ont., were recently incorporated to manufacture and deal in fruit baskets and wood containers of all kinds. Capital $75,000. T. B. Revett and W. H. Hunter, fruit growers, of Lincoln county, are among the incorporators. The fruit growers in the Niagara district were severely handicapped last season due to a shortage of fruit baskets. This seems to have stimulated basket-making in that district, as several new organizations have been formed to manufacture this line.

The Laminated Materials, Limited, New Westminster, B.C., were recently incorporated to manufacture and deal in veneers and panels made of cottowood and to take over as a going concern the business known as Laminated Materials Co. This company use a special waterproof glue, prepared under their secret formula, which renders their product waterproof and impervious to weather conditions. Their output is confined largely to three-ply for the construction of shipping containers. The capital of the new company is $400,000.

The Berliner Gramophone Co., Limited, Montreal, P.Q., recently erected a beautiful memorial tablet on the Lacasse St. side of their new million dollar phonograph and record plant, as a tribute to the men who left their employ to don the King's uniform. The tablet is suitably inscribed and bears the names of all employees who enlisted, including two who paid the supreme sacrifice. Lieut.-Col. McMullen of St. John, N.B., officiated at the unveiling of the tablet at which the directors, officers and a large number of employees were present.

John W. Frid, of the well-known Frid Construction Co., Hamilton, Ont., recently expressed the opinion that in the near future building costs will undergo a reduction of at least 20 per cent. That no marked reductions in prices in this industry have taken place so far, is due largely to the fact that this is a very slack period for builders. The outlook for 1921 is, however, very promising, and while costs of building are bound to decline, he felt certain that the trade in general would be better off, as lower prices mean grater building activity.

Reports to the Manufacturers' Aircraft Association from operating companies in the South indicate that society is manifesting an increasing interest and confidence in travel by air. The latest word to this effect is from the Aeromarine West Indies Airways, Inc., which reports the transportation over the week end (Dec. 18-20) of Lord Waldorf Astor and party of nine from Miami to Bimini. The distinguished tourists chartered one of the Aeromarine Navy cruisers, fourteen passengers capacity, operating regularly between Florida and West Indian ports.

Germany is gradually regaining her former position in the toy markets of the world. In 1914 the total value of toys imported from Germany to the United States was $7,718,000. This decreased to practically nothing during the war, but this year the importations are valued at $3,800,000, which means that within two years she has succeeded in recovering about 50 per cent. of the toy trade formerly done with America. During this same period the Japanese manufacturers have not been idle. In 1914 they shipped $435,000 worth of toys into the States, while in 1920 this has been increased to $5,075,000.

At the close of their fiscal year, September 30th, the Canada Car & Foundry Co., Limited, Montreal, P.Q., had unfilled orders on hand to the value of $26,000,000. This compares more than favorably with the orders on hand at the close of their fiscal year, 1919, which amounted to $8,500,000. This large amount of unfilled business ensures a

QUARTERED OAK

There is hardly a wood that varies in quality to the extent that does Quartered Oak.

The real intrinsic value of the same grade may vary 50% and even more depending on character of timber, method of manufacture, etc.

Our Quartered Oak is manufactured from our own virgin growth timber than which there is none finer to be had. We cut only the very cream of our logs into this wood. We manufacture no veneers, veneer flitches nor do we sell any of our best logs for veneer—no diversion of part of our logs to bring down the quality or average width of our product—the very best of it goes into our Quartered Oak lumber. Very few mills pursue such policy.

Our Quartered Oak is "full quartered" insuring the best possible figure; every piece plump thickness and all the wide in.

Thus we are able to offer the acme of quality in Quartered Oak, either White or Red.

Also sole producers of "the kind that's different" in Gum—it's straight, bright and flat.

EVERY BOARD BRANDED

Our protection THE KRAETZER-CURED LUMBER CO. *Your guarantee*

The Kraetzer-Cured Lumber Co.

GENERAL OFFICE: GREENWOOD, MISS.

Band Mills: Greenwood, Miss., Moorhead, Miss.

steady output for some time to come. Taking into consideration the improved labor conditions and the fact that the bulk of the materials required to handle this business is now on hand, the directors are hopeful that the results for the ensuing year will prove very satisfactory.

The Collingwood Shipbuilding Co., who have undertaken to complete the unfinished hulls in the yard of the Dominion Shipbuilding Co., Toronto, are having considerable trouble in securing workmen. The company are offering 75c per hour, while the union workers are standing out for 90c per hour. Most of these men have been idle since the Dominion Shipbuilding Co. ceased operations some months ago, and one would think that 75c an hour would appeal to them far stronger than standing around in idleness while holding out for a higher figure. The whole question is being referred back to the Dominion Government and it is hoped that a satisfactory arrangement will be arrived at speedily.

The Winnipeg Motor Cars, Limited, Winnipeg, Man., were recently incorporated with a capital of $1,000,000, to manufacture and deal in motor cars. The company have purchased the Rat Portage Lumber Company's property on Marion St., and are altering the plant to suit their requirements. The new car, which will be known as the "Winnipeg," will have a 4-cylinder engine and will be made in the usual bodies. It is designed to sell at about $1,700. A line of 1½ and 2-ton trucks may be manufactured in the near future. The personnel of this company is as follows: F. A. Ogletree, president; L. Arseneault, vice-president; C. L. Lane, mechanical superintendent, and D. E. Ogletree, secretary-treasurer.

Knox Bros., Limited, Montreal, P.Q., lumber dealers, have purchased the plant of the Davies Shipbuilding & Repairing Co., Limited, at St. Joseph de Levis, P.Q., and are equipping it with the machinery needed for remanufacturing lumber. This company has a large quantity of B. C. timber on their hands and in addition about 10,000,000 feet of Quebec spruce left over from export contracts. In order to market the material advantageously, they decided to equip an up-to-date saw and planing mill at Levis to remanufacture this stock. The installation includes an 8-foot band saw, a number of 6-inch band resaws, together with six planers. It is the intention to equip a plant for making box shooks in the near future. The present owners believe that when they have their new plant operating to full capacity, it will be one of the largest woodworking installations in Canada.

The Gold Medal Furniture Mfg. Co., Limited, recently held a sales convention at their head office in Toronto. This convention marked the thirtieth birthday of an organization which has steadily developed from a small beginning up to the present large organization operating factories at Toronto, Montreal, Winnipeg, Man., and Uxbridge, Ont. W. J. McMurtry, who founded this business thirty years ago, is still actively engaged as its president and general manager. He presided over the convention. Managers and superintendents from the four factories and fifteen of the firm's representatives from Coast to Coast were in attendance. The first two days of the meeting were taken up with inspecting the plants at Toronto and Uxbridge. This firm is justly proud of the enviable record they have attained during thirty years of aggressive manufacturing and merchandising.

Personals

Edward Clark, of Edward Clark & Sons, Toronto, Ont., wholesale lumber dealers, left recently to spend the winter months in California.

J. A. McFadgen, president of the Manufacturers' Lumber Co., Stratford, Ont., left recently, with a party of Canadian curlers, for a two-months' trip to Scotland.

Chas. Baetz, of the Baetz Bros. Furniture Co., Limited, Kitchener, Ont., was re-elected alderman for that city. Mr. Baetz made a very good showing, being second on the list.

J. B. Leadley has been appointed city clerk of Guelph, Ont. Mr. Leadley has for many years been connected with the staff of the Bell Piano & Organ Co., Limited, of Guelph.

John Hall, Toronto, Canadian representative of the W. M. Ritter Lumber Co., Columbus, Ohio, returned recently from a holiday in Virginia, and other lumber-producing states.

Gordon Kribs, manager of W. A. Kribs Co., Limited, Hespler, Ont., manufacturers of washing machines and freight handling trucks, was elected alderman, at the civic elections held recently in Hespeler.

At the civic elections recently held in Chesley, Ont., the following furniture men were elected to office: J. W. Heiserman of the Chesley Furniture Co., reeve; W. E. Durst of the same firm, councillor; and W. P. Krug of The Krug Bros. Co., Limited, councillor.

Walter T. Piggott, of the Piggott Lumber Co., Windsor, Ont., was recently married to Miss Josephine Smith, daughter of Mr. and Mrs. Angus McD. Smith. The many friends of Mr. Piggott in both the lumber and woodworking trades extends congratulations and wish this popular woodworker and his bride a long life and a happy one.

H. R. Magwood, of the F. E. Coombe Furniture Co., Limited, Kincardine, Ont., was recently elected councillor for 1921. This will be Mr. Magwood's second term in office. In this connection it may be of interest to note that Mr. Magwood headed the poll and received the largest number of votes ever cast for a councillor in any municipal election in Kincardine.

Obituary

James Sparling, who operated a planing mill at Meaford, Ont., died very suddenly recently at his place of business. In addition to the planing mill, he conducted a building and contracting business.

Chas. Turner recently passed away at his home in Penetanguishene, Ont. Mr. Turner conducted a woodworking factory in Toronto for many years. Upon moving to Penetang he received a Government appointment as head carpenter, which position he held for thirteen years.

Wm. Edwards recently passed away at his home in Gananoque, Ont. Mr. Edwards was one of the pioneer business men of that town and established the furniture manufacturing and retail business, now being carried on by Wm. Edwards, Jr., over 50 years ago. At one time Mr. Edwards built many boats and yachts. He is survived by two sons, Andrew, a well-known traveller, and William, who is carrying on the business.

Harvey Derne, superintendent of manufacture of the W. M. Ritter Lumber Co., Columbus, Ohio, was killed recently in an automobile accident. Mr. Derne had a wide circle of friends in the lumber and wood-using industries and his sterling qualities as a man, coupled with his business ability and technical attainments, made him a prime favorite and gave him a place of distinction in industrial circles. He had a complete understanding of the various details of the practical problems pertaining to everp branch of hardwood lumber manufacturing and was considered to be one of the leaders of the hardwood industry.

Calendars, Catalogs, Etc.

The Wayne Lumber Co., New York, N.Y., have issued an attractive calendar. The illusaration shows a scene in the log yard of their Airdondack mills and depicts the unloading and piling of the raw product. This firm specializ in birch and beech.

A very attractive calendar has been received from the Wilson Box Co., Limited, manufacturers of wooden boxes, St. John, N.B. The picture, which is entitled "Anxious Moments," depicts a pioneer and his Indian guide, shooting a particularly wicked-looking stretch of rapids..

An attractive and useful holiday souvenir, in the form of a brass ash container or ash tray, has been received from the Perkins Glue Co., Lansdale, Pennsylvania, manufacturers of Perkins' vegetable glue. This ash tray is made in two parts so that it may be taken apart apart to empty.

The Pickrel Walnut Co., St. Louis, Mo., are sending out a useful and attractive calendar in the form of a wall pad. The numerals are large and conspicuous, being about 4 inches high. The scene shown is a view of their log pond, and gives an idea of the large number of logs which they keep on hand.

One of the good old-fashioned office calendars, with large plain figures, has been received from Messrs. Palmer & Parker Co., importers and manufacturers of mahogany, hardwood lumber and veneers, Boston, Mass. This well-known business is rapidly nearing the century mark, having been established in 1833.

LUMBER OF QUALITY

Rightly Graded - Promptly Shipped - Attractively Priced

4/4 to 16/4	White & Black Ash
" " 12/4	Basswood
" " 16/4	Birch
" " 16/4	Beech
" " 12/4	Hard Maple
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Belt Sander, Curtiss No. 20.
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Matcher, American No. 229 Fast Feed Hardwood Flooring.
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MONTREAL

Materials Used in Dry Kiln Construction

Any of the ordinary building materials — wood, brick, tile, or concrete—may be used in the construction of a dry kiln. The choice between them will depend upon the relative importance of the first cost, maintenance, and fire hazard. The following comments on each type are based on the experience of the U. S. Forests Products Laboratory.

Where insurance rates permit, a well-built wood kiln is very satisfactory, wood being a very good insulator, easily repaired, and cheaper than the other materials. The chief objection to the use of wood, aside from fire risk, is its tendency to swell and shrink with alternate moist and dry conditions, causing more or less working of the frame and loosening of nails. All lumber should be thoroughly seasoned. Fir, Douglas fir, yellow pine, redwood, cypress, and simliar woods with low shrinkage rates should be used for sheathing and sills. For frame timbers any good straight-grained material is suitable. The sheathing should be shiplap laid horizontally and nailed twice at each stud, in the middle and at the bottom of the board. Outside walls should be sheathed on both sides or sheathed inside and plastered outside. They should also be insulated with a good moisture-proof, heat-resistant insulator. The ordinary quilt insulations sewed between so-called waterproof paper have not proved satisfactory in dry kiln construction. Walls should be painted on the inside with asphaltic paint. Where lumber is plentiful, crib or laminated construction may be used, the walls being built up of 2 by 6 inch planks laid flat, and the roof of similar material laid tight together. If the planks are well seasoned and well manufactured, this form of construction permits very little heat loss; but if the lumber is low grade and knotty, a tight, weather-resistant construction is extremely difficult to obtain. The shrinkage of the walls is excessive, and causes considerable trouble at door jambs and where pipes pass through the walls.

Brick or hollow tile is procurable almost everywhere, and where permanency is desired is usually more satisfactory than wood. The brick or tile should be hard burned. The walls should be laid up in tempered or cement mortar. Unequal expansion in the exterior walls, caused by the difference in temperature of the outer and inner faces, is almost certain to create numerous small cracks, which should be painted up with an elastic cement rather than mortar. A kind tile should be chosen that has openings running horizontally rather than vertically in the wall. The tile should be scored for plastering. Both sides of tile walls should be plastered with cement mortar. When brick, tile, or concrete kilns are over 50 feet long, it is advisable to build both the exterior and interior walls 12 inches thick, particularly if fireproof roofs are used.

Walls of monolithic concrete or of concrete blocks are highly absorbent of moisture unless thoroughly water-proofed. It is very difficult to hold a high humidity within a kiln whose walls absorb moisture readily. The heat loss through such walls is also very great.

The direct motor drive saves the cost of upkeep of a belt. This is a considerable item on some machines.

Badly worn rubber bands on band saw wheels should be replaced as they cause the blades to break.

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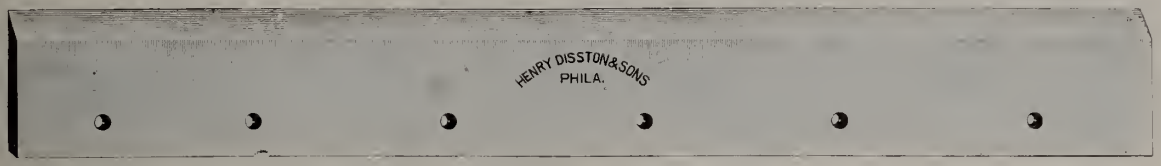

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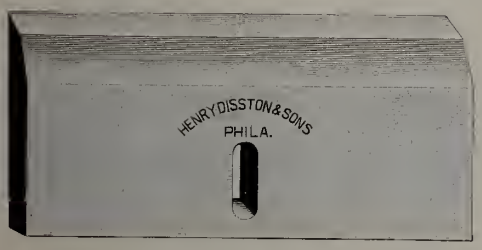

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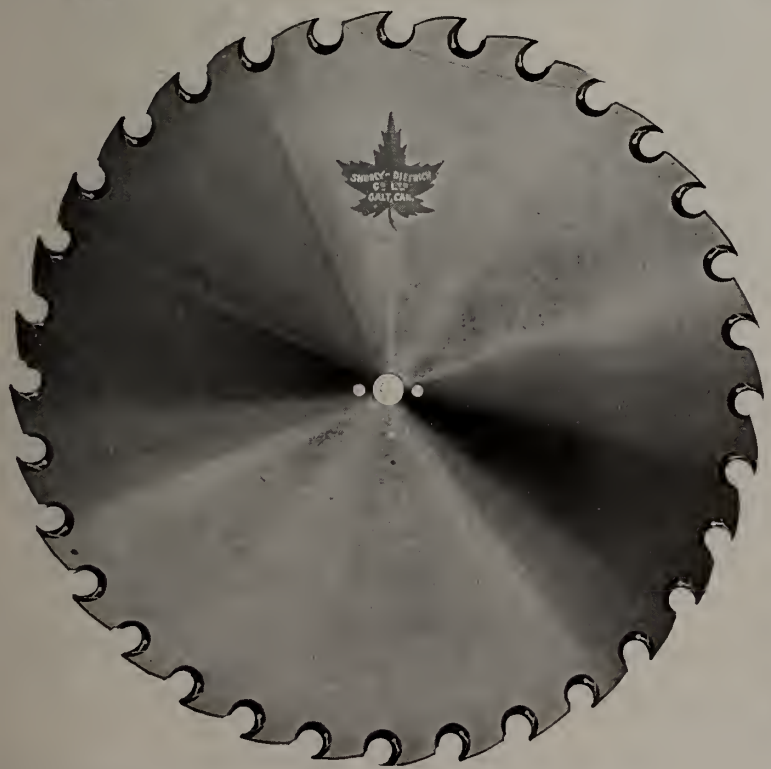

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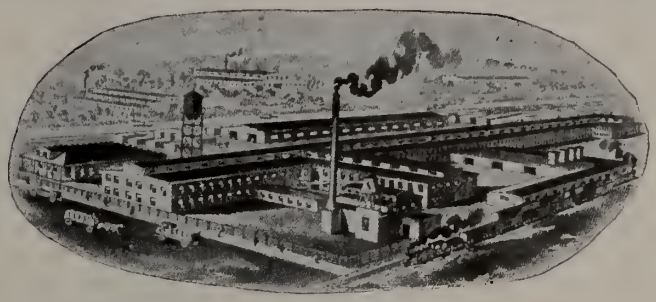

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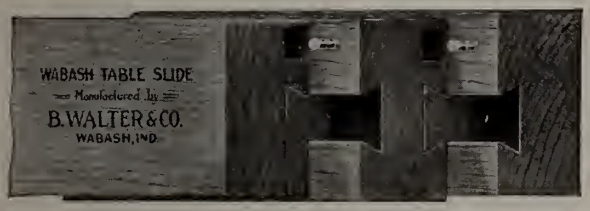

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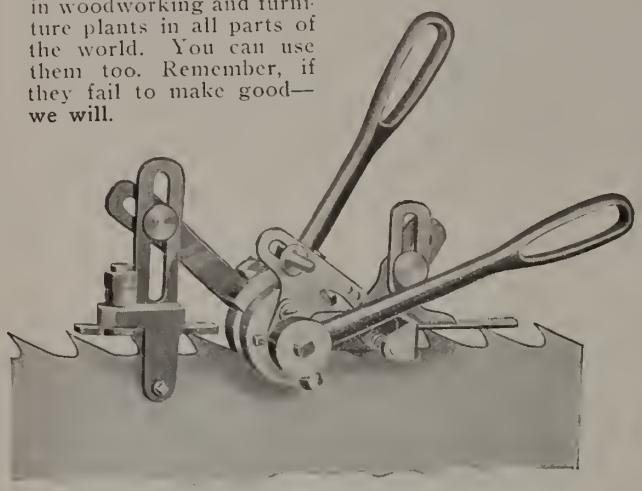

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No.	Opening at Top inches	Height inches
A808	1	1
B808	1¼	1¼
C808	1½	1¼
D808	1¾	1½
E808	2	2
F808	2¼	2¼

Style 814

No.	Opening at Top inches	Height inches
A814	1	⅞
B814	1¼	1
C814	1½	1⅛
D814	1¾	1⅜
E814	2	1½
F814	2⅜	2⅛

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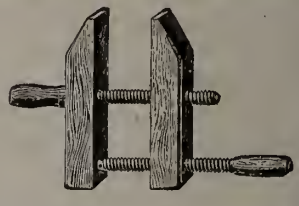

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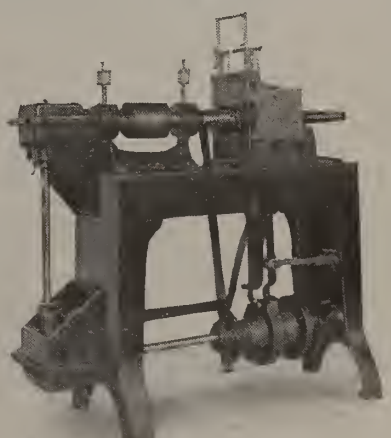
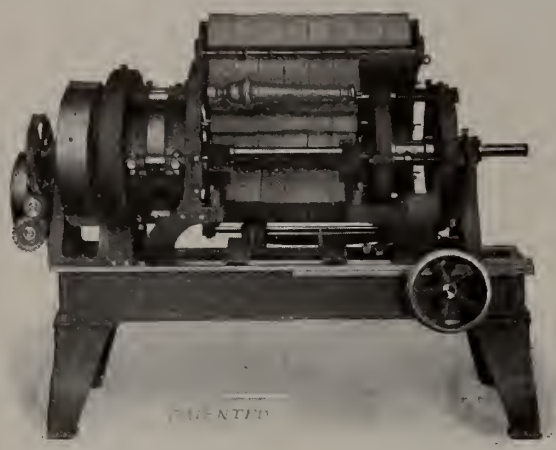


JUST A MINUTE



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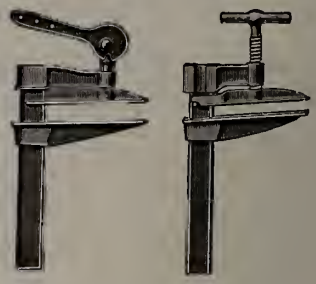

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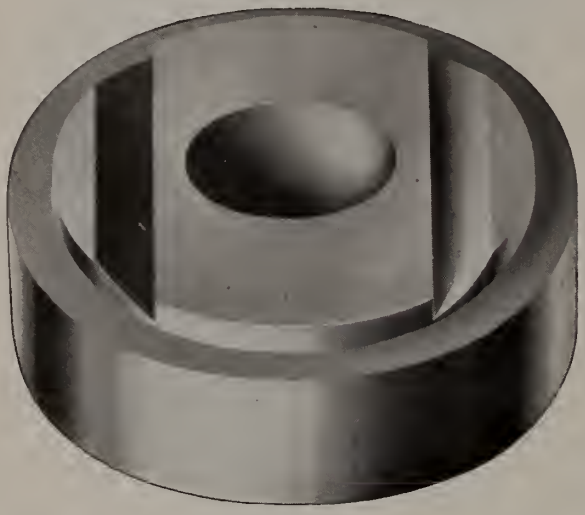
Ball Bearing Shaper Guide Collars

A Decided Improvement Over the Revolving Solid Collars Now in Use



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The friction set up by stock or patterns bearing against solid revolving collars is entirely eliminated when ball-bearing shaper collars are used. Every shaperman knows the effect of this friction on stock being run, and so will appreciate the real value of these new shaper collars.

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To save your patterns, stop spoilage of stock and in an easy manner, enable your operator to do more work, you should try out these new ball-bearing shaper collars —note the results by actual operation in your own plant.

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GARNET PAPER
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THEIR USE MEANS EFFICIENCY

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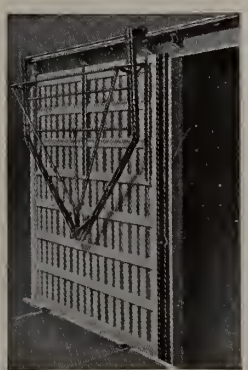

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Yates Machine Co., P. B., Hamilton, Ont

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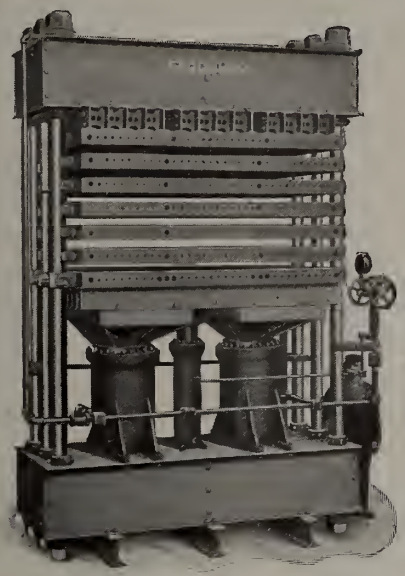

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The illustration shows a special Veneer Press Outfit recently manufactured. We make a specialty of designing Hydraulic Presses, Accumulators, etc., to suit individual requirements. Our Standard Monarch Veneer Press is built for 100-lbs. working pressure. There are six sizes, and we also make a complete assortment of Pumps, Valves and other equipment. Press catalogue No. 19 gives details of the Farquhar line. Write for this booklet.

A. B. FARQUHAR CO., Limited, Box 171, York, Pa.

Eastern Handle & Dowel Company, Limited

Farm Point - Quebec

High Grade

HANDLES AND DOWELS

We give special attention to Hardwood Dowels of Beech, Birch or Maple

Our Motto:
Quality, Efficiency and Fair Treatment

Please send us your enquiries and it will be a pleasure to quote you

Special attention given to all wood turnings

OAKEY'S

Glass Paper, Flint Sand Paper, Garnet Paper

IN SHEETS AND ROLLS FOR ALL PURPOSES

Rolls 50 yards long, 18 in., 20 in., 24 in., 30 in., 36 in., 40 in , 42 in. and 48 in., wide

SHEETS, DISCS, STRIPS AND BANDS can be made to Special Sizes to suit the requirements of Purchasers

JOHN OAKEY & SONS, LTD., WELLINGTON EMERY AND BLACK LEAD MILLS LONDON, S. E. 1.

Canadian Agents:

F. Manley, 343 Garry St., Winnipeg, Man.

Sankey & Manson, 839 Beatty Street, Vancouver, B.C.

"Canadian Woodworker" Buyers' Directory—Continued

PLANERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Petrie, H W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co.. P. B., Hamilton, Ont.

PLANING MILL MACHINERY
Canada Machinery Corporation. Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PORTABLE DRILLS
Wisconsin Electric Co., Wisconsin, U.S.A.

PRESSES (Veneer)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Jackson, Cochrane & Company, Kitchener, Ont.
Perrin & Co., Wm. R., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

REED
Overseas Reed and Cane Co., Ionia, Mich.

RESAWS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

RIM AND FELLOE MACHINERY
Defiance Machine Works, Defiance, Ohio.
Fay & Egan Co., J. A. Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

ROSETTES
Waddell Mfg. Co., Grand Rapids, Mich.

RUBBING MACHINES
DeVilbiss Mfg. Co., Toledo, Ohio.
Mattison Machine Works, Rockford, Ill.

SAFETY DEVICES
Cowan & Company, Galt, Ont.

SANDERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Loeffler Machine Co., Wm. Sheboygan, Wis.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SAND PAPER
Manning Abrasive Company

SASH, DOOR & BLIND MACHINERY
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Elliot Machinery Co., Belleville, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Preston Woodworking Machinery Company Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SAWS
Atkins & Co., E. C., Indianapolis, Ind.
Disston & Sons, Henry, Toronto, Ont.
Elliot Machinery Co., Belleville, Ont.
Radcliff Saw Mfg. Company, Toronto, Ont.
Shurly-Dietrich, Ltd., Galt, Ont.
Simonds Canada Saw Co., Montreal, Que.
Wallace & Co., J. D., Chicago, Ill.

SAW BENCH
Wallace & Co., J. D., Chicago, Ill.

SAW SWAGES
Cowan & Company, Galt, Ont.
Crowel, D. J., Buffalo, N. Y.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Radcliff Saw Mfg. Co., Toronto, Ont.

SAW TABLES
Canada Machinery Corporation, Galt, Ont. ..
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Yates Machine Co., P. B., Hamilton, Ont.

SCRAPING MACHINES
Canada Machinery Corporation, Galt, Ont. ..
Garlock-Walker Machinery Co., Toronto, Ont.
Whitney & Sons, Baxter D., Winchendon, Mass.

SCREW DRIVING MACHINERY
Reynolds Machine Co.. Massillon Ohio.

SCROLL SAWS
Canada Machinery Corporation, Galt, Ont. ..
Casey Co., M. E., Montreal, Que.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane, & Company, Kitchener, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamiltonfi Ont.

SECOND-HAND MACHINERY
Casey, M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Osborne Sexton Machinery Co., Columbus, O.
Petrie, II. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto. Ont.

SHAPERS
Canada Machinery Corporation, Galt, Ont.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Petrie, II. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Sons, Baxter D., Winchendon, Mass
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SHAPER COLLARS
Woodworkers Tool Works Chicago, Ill.

SHAVING COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

STAINS
Ault & Wiborg, Toronto, Ont.
Marietta Pairt & Color Co., Marietta, Ohio.
Shannon Co., Ed. J., Cincinnati, Ohio.
Williams Bros. & Co., Hounslow, Eng.

SINGLE SPINDLE BOXING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

STAVE SAWING MACHINE
Whitney & Son, Baxter D., Winchendon. Mass

STEEL DOOR MATS
Cary Mfg. Company, Brooklyn, N.Y.

SURFACERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Yates Machine Co., P. B., Hamilton, Ont.

SWING SAWS
Canada Machinery Corporation. Galt, Ont.
Casey Co., M. E., Montreal, Que.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Eaglesfield, R. D., Indianapolis, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE LEG LATHES
Fay & Egan Co., J. A., Cincinnati, Ohoa.
Mattison Machine Works, Rockford, Ill.
Whitney & Son, Baxter D., Winchendon, Mass.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE SLIDES
Jefferson Woodworking Co., Louisville, Ky.
Walter & Company, B., Wabash, Ind.

TEMPERATURE REGULATORS
Canadian Powers Regulator Co., Toronto, Ont.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Compan, Kitchener, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TIME CLOCKS
International Business Machines Co., Toronto, Ont.

TOPS
Gorham Bros., Mount Pleasant, Mich.

TRIMMERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Preston Woodworking Machinery Company, Pretson, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TRUCKS
Cowan Truck Company, Toronto, Ont.
National Dry Kiln Co., Indianapolis, Ind.

TURNED WOOD GOODS
Algoma Wood Products Co., Algoma, Wis.

TWINES & WEBBING
Doon Twines, Ltd., Kitchener, Ont.

MORGAN
NAILING MACHINES

Are built strongly for heavy continuous service. Machines adapted to all kinds of special nailing.

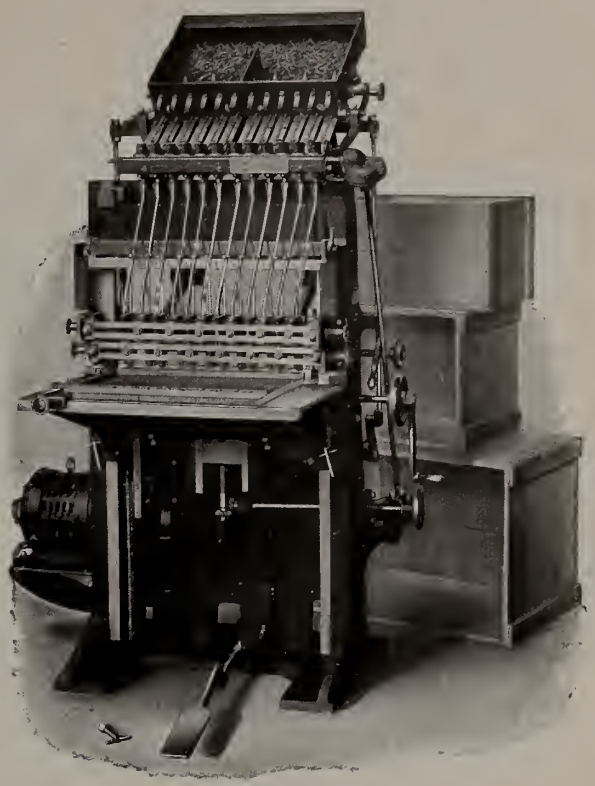
Regular machines for all sizes of boxes and crates.

Write us for descriptive literature.

Machines that save money

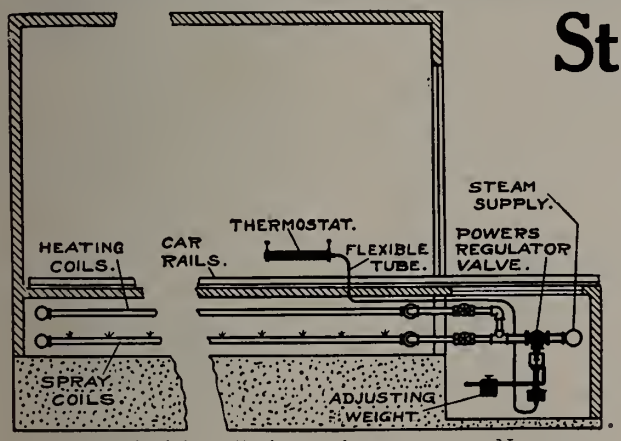
Morgan Machine Co.

DEPT. A ROCHESTER, N.Y.



Morgan No. 12-30 Open Back Nailing Machine, Fitted with motor.

Automatic Temperature Control Standardizes Product



Typical installation of a powers No. 15 Regulator in a Lumber Dryer. Adjusting weight may be moved outward to give progressively higher temperature. This regulator in charge of the temperature, results in practically automatic humidity control.

Personal attention to temperature control is expensive and always unsatisfactory. An automatic regulator gives definite results.

Standardization means less loss, a better product, and more profit.

Powers Heat Regulators are successfully used in the control of dry kilns, varnish rooms, glue heaters, washing and dyeing processes, bleaching equipment, chemical treaments, plating solutions, and many others too numerous to mention.

Write for Bulletin 138.

Put any problem of temperature control up to us. Our experience of 30 years is at your service.

The Canadian Powers Regulator Co., Limited

Specialists in Automatic Heat Control

82 Chestnut Street - - - TORONTO, ONT.

"Canadian Woodworker" Buyers' Directory—Continued

UPHOLSTERY FABRICS
Burch Co., A. F., Grand Rapids, Mich.

UPHOLSTERY SUPPLIES
Burch Co., A. F., Grand Rapids, Mich.

VARNISHES
Adams & Elting Co., Chicago and Toronto.
Ault & Wiborg Company, Toronto. Ont.
Flint Varnish & Color Co., Montreal, Que.
Penfound Varnish Co., Toronto, Ont.

VARNISH DRYERS
Nicholls Co., A. S., New York, N.Y.

VARNISH SPRAYERS
DeVilbiss Mfg. Co., Toledo, Ohio.
Paasche Air Brush Company, Chicago, Ill.

VENEERS
Astoria Mahogany Co., New York, N.Y.
Batesville Lumber & Veneer Co., Lawrenceburg, Ind.
Birds Eye Veneer Co., Escanaba, Mich.
Bury & Compny, Robert, Toronto, Ont.
Central Lumber Co., Indianapolis, Ind.
Christmann Veneer & Lumber Co., St. Louis, Mo.
Curtis Co., C. E., Chicago
Dean Spicker Company, Chicago, Ill.
Empire Veneer Company, Chicago, Ill.
Evansville Veneer Co., Evansville, Ind.
Freiberg Lumber Co., Cincinnati, Ohio
Hartzell, Geo. W., Piqua, Ohio.
Hoffman Bros. Company, Fort Wayne, Ind.
Holden, Henry S., Chicago, Ill.
Geo. Kersley, Montreal, Que.
Korn-Conkling Co., Memphis, Tenn.
Long-Knight Lumber Co., Indianapolis, Ind.
Litton Veneer Co., Rockford, Ill.
Memphis Veneer & Lumber Co., Memphis, Tenn.
Mowhawk Veneer Co., Warren, Pa.
Munising Woodenware Co., Munising, Mich.
Nartzik, J. J., Chicago, Ill.
National Veneer & Lumber Co., Indianapolis, Ind.
North Vernon Lumber Co., North Vernon, Ind.
Northwestern Cooperage & Lumber Co., Gladstone, Mich.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod-Jurden Co., Memphis, Tenn.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Veneer Co., New Albany, Ind.
Roberts, Geo. G., Chicago, Ill.
Southern Veneer Mfg. Co., Louisville, Ky.
Stimson Veneer & Lumber Co., Memphis, Tenn.
Sturm Co., Adolph, Chicago, Ill.
Talge Mahogany Co., Indianapolis, Ind.
Thompson & Co., Lewis, Philadelphia, Pa.
Toronto Veneer Company, Toronto, Ont.
Veneer Manufacturers Co., Chicago, Ill.
Waetjen & Co., George L., Milwankee, Wis.
Warren Ross Lumber Co., Jamestown, N. Y.
Williamson Son Veneer Co., William, Chicago, Ill.
Wood Mosaic Co., Louisville, Ky.

VENEER TAPE
Canadian Nashua Paper Co., Peterboro, Ont.
Gummed Products Co., Troy, Ohio.
Ideal Coated Paper Co., Brookfield, Mass.

VENTILATING APPARATUS
Canadian Blower & Forge Co., Kitchener, Ont.

VENEER JOINTERS
Garlock-Walker Machinery Co., Toronto, Ont.

VENEER MACHINERY
Garlock-Walker Machinery Co., Toronto, Ont.

VENEER PRESSES (Hand and Power)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Perrin & Company, Wm. R., Toronto, Ont.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Johnson Co., O. E., Chicago, Ill.

WALNUT LUMBER
American Walnut Mfrs. Assn., Chicago.
Des Moines Saw Mill Co., Des Moines, Iowa.
Pickrel Walnut Company, St. Louis.
Purcell Walnut Lumber Co., Frank, Kansas City.

WIRE
Laidlaw Bale-Tie Co.. Hamilton, Ont.

WIRE BOX STRAPPING
Cary Mfg. Company, Brooklyn, N.Y.

WOOD FINISHES
Adams & Elting Co., Chicago and Toronto
Ault & Wiborg, Toronto, Ont.
Penfound Varnish Co., Toronto, Ont.

WOODWORKING MACHINERY
General Machinery Co., Toronto, Ont.

WOOD STAINS
Williams Brothers & Co

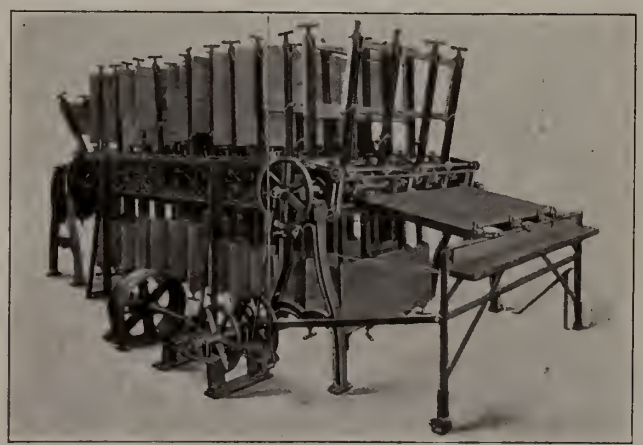
WOOD TURNING MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont
Mattison Machine Works, Rockford, Ill.
Yates Machine Co., P. B., Hamilton, Ont.

WORK BENCHES
Fay & Egan Co., J. A., Cincinnati, Ohio.

WOOD LATHES
Colladay Machine Works, Indianapolis, Ind.

WOODWORKING SPECIALTIES
Brantford Pattern Works, Brantford, Ont.

One Man Does the Work of Two
with a Billstrom Glue Clamp Carrier



For every plant where much edge-gluing is done there is a real need for a Billstrom.
Here's why:—

The empty clamp is held at just the right height for the greatest convenience of the workman.
When the clamp is filled he pulls a cord, which carries the filled clamp away and deposits an empty one in its place.
One man can accomplish as much by using it as two men can do employing the old methods.
It holds the work off the floor until the glue has set, when the glued stock can be quickly removed and piled flat, thus greatly conserving space.
It reduces the labor and cost of edge gluing to the minimum.
There is a sizs to suit your particular requirements.

N. J. BILLSTROM
2002 NINTH ST. ROCKFORD, ILL.

44 Yates No. 275
36 and 66-in. Automatic
Knife Grinders,
Brand New, at
One-half Price

Machines arranged for Motor Application as per cut, or regular belt drive, if wanted.

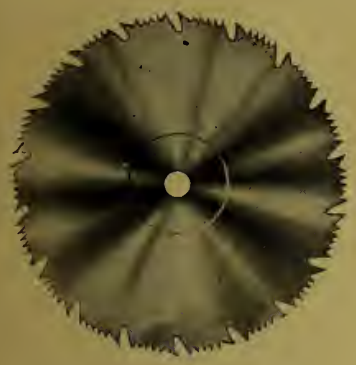
We have in Cincinnati, available at once, three Whitney 30-in. single surfacers and two Whitney 30-in. double surfacers, all with sectional rolls; three double arbor revolving saw tables; three single arbor tilting table saw benches; F.&E. single-end tenoner with roller table, and a few other choice machines. All are in exceptionally fine condition—are doing precision work at the present time.

7 New Hermance Molders, 8, 10 and 12-in., Stationary and slip-on heads.
8 New Andrew Multiple Vertical Borers, 20, 30, 42 and 60-in., any number of heads.

Band saws, 32, 36 and 38-in.
Borer, Andrew, 10-ft., 13-spindle, power table.
Borers, Andrew mult. vert., 20, 42 and 60-in., new.
Door clamp, Fay-Egan, heavy.
Door clamp, Jenkins-Hayes power-feed.
Edgers, two, three and four saws.
Glue cookers and retainers.
Jointers, 8, 12, 16, 20, 24 and 30-in.
Lathes, speed, eight, mounted on iron bed.
Lathes, turning automatic, Mattison No. 8 Yates No. 72, practically new.
Matcher, American Northwest, 24x8-in., 3 sides.
Matcher, 24x6-in., 3 and 4 sides.
Molders, 4-side, 9, 10 and 12-in. American.
Molder, Fay & Egan, 12-in. outside, heavy.
Mortiser, chain saw, New Britain No. 7, new.
Mortisers, F. & E. vertical, hollow-chisel; also plunger type; Greenlee vertical, double hollow-chisel.
Nailers, two, Hayes, 8-track, 8d, closed back.
Nailing machines, 2 closed back, 4-track, 4d, 15-in. spread, Hayes' make.
Pony planers, 16, 20 and 24-in.
Rip saws, self-feed, Hoosier, F. & E. Greenlee.
Rip saw, gang, Luther, for box work.
Router for stair stringers.
Sand belt, closet seat and similar work.
Sander, H. B. Smith, spindle and disc, practically new.
Sanders, 30- 42 and 54-in. Columbia; 30, 42 and 48-in. Invincible; 30 and 36-in. F. & E. double.
Saw, 8-ft. double cut-off, roller table.
Saws, combination and variety, single and double arbor, also tilting arbor, stationary and tilting table, 24 and 30-in. circular resaw.
Saw, circular re-slab, 40-in. blade, power feed rolls.
Shapers, Fay single-spindle reversible, also Shimer single with overhead routing attachment.
Shaper, Whitney No. 7 and 8 double-spindle, practically new.
Surfacer, 30-in. double, cabinet, B. & M., practically new.
Surfacer, Whitney 30-in. double, sectional roll and sectional chipbreaker; American No. 4½, 36-in. sectional and solid; Fay & Egan No. 140, 27 and 30-in. double divided rolls; also 18, 20, 24 and 30-in. single cylinder panel planers.
Tenoners, Fay & Egan double-end, also single-end.
Window frame machine for production work, new.
Window frame machines, Smith & Phillips combination.
Wood-worker, universal, Fay & Egan and Bentel & Margedant. One lot of glue room machinery.

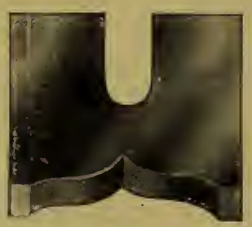
We have just received two carloads of Band Saws and Jointers—all new—which are ready for immediate delivery.
Band Saws, 20, 26, 32, 36 and 38-in. Jointers, 8, 12, 16 and 24-in.

The Osborne & Sexton Machinery Co.
Re-manufacturers **COLUMBUS OHIO**



100% Production

will be necessary to meet the demand for all wood-working material and furniture that will be required for the 4,000,000 buildings that must be erected in 1921.



ATKINS

STERLING QUALITY

SAWS and KNIVES

will make it possible for you to meet this demand in producing your share.

The high grade material and expert construction of Atkins Saws and Knives make possible the superior service they render.

Let Their Efficient Performance Tell You the Atkins Story of Perfection.

Write to-day for our Knife Booklet "CW" and Pattern Template Paper.

E. C. ATKINS & CO., ***Makers of Sterling Saws***

Factory—HAMILTON, Ont. **Vancouver Branch—109 Powell Street**

Rub Your Varnish Electrically

with a

MATTISON
ELECTRIC
Rubbing Machine

—operates direct from a lamp socket

By doing the work of two hand rubbers, the Mattison Electric cuts wages 50%, thus paying for itself many times over every year. It is a power unit complete in itself, consumes very little current, and requires no special hose or piping.

Any flat varnished surface, larger than the machine itself can be rubbed to better advantage with this portable electric rubber than by any other method.

The machine is very easy to handle, and relieves the operator of all the hard labor of hand rubbing. His attention is concentrated on his work; and with the machine he produces a finish much more uniform than is possible by hand.

Ask for bulletin "165" and get detailed information

MATTISON MACHINE WORKS

Main Office and Works ROCKFORD, ILLINOIS, U. S. A.

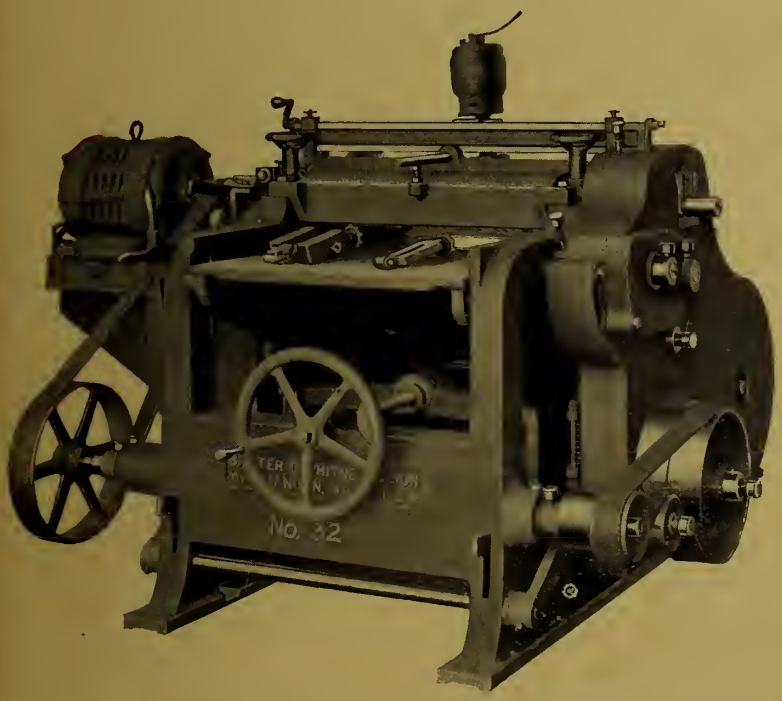
Branch Sales Offices;—1735 Republic Bldg., Chicago. Greensboro, N. Car. 703 World's Tower Bldg., New York City

Volume Twenty-One TORONTO, FEBRUARY, 1921 Number Two

CANADIAN WOODWORKER and Furniture Manufacturer

A Whitney Direct Motor Driven Planer

Should be running in your Plant



Because it requires
- No Countershaft
- No Driving Belts

Saves
- Belt Expense
- Floor Space

Can be erected and operated without shafting.

Can be set in the most convenient place.

Produces better work and more of it.

WRITE FOR BOOKLET

BAXTER D. WHITNEY & SON, Inc., Winchendon, Mass.

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553 Monadnock Bldg.,
San Francisco, Cal.

New York Office:
World's Tower Building,
110 West 40th Street.
C. L. Babcock, Manager.

Canadian Representatives:
H. W. Petrie, Limited,
Toronto, Ontario.

Alphabetical Index to Advertisers, Page 12

Model 1-D Portable Drill

HANDY—ECONOMICAL—EFFICIENT

Specifications:

Length—10 inches.

Weight—4¾ pounds.

Capacity—Steel, 0 to $\frac{3}{16}$". Wood and alloys, 0 to $\frac{1}{4}$".

Motor—Universal, on either direct or alternating current.

Diameter of Motor—3⅜ inches.

Spindle—Offset from center $\frac{3}{32}$".

Helical Gears.

Aluminum Handle.

Complete with 10-ft. cord, plug, switch and chuck.

Jacob's Chucks used as a regular equipment.

FOR speed in drilling and countersinking small holes, this tool is just what you need. It can be used on any kind of material—steel, iron, brass, aluminum or wood—and gives lasting service.

If your dealer cannot supply you with the Model 1-D, tell us about your requirements.

Wisconsin Electric Company
7132 Sixteenth Street, Racine, Wisconsin, U. S. A.

DUMORE GEARED ELECTRIC DRILLS

FIRST CLASS MECHANICS

used these tools in a plant operated by large departmental store for manufacturing high grade fixtures; these

Machines are in the Best of Condition

and are offered at prices which are sure to interest you now that business is showing such a pronounced improvement.

1—McGregor-Gourlay Double Arbor Universal Saw Table, same as C.M.C. No. 618, with 14″ saws, self-contained countershaft, full complement of gauges, saws, wrenches, etc.

1—Ditto as above.

1—Ballantine 36″ Band Saw, with solid lower wheel, complete with saw blades, wrenches, etc.

1—McGregor-Gourlay Two Spindle conical Bronze Bearing Shaper, with plain countershaft, 24″ centers, 1⅛″ spindles, roller bearing loose pulley, complete set fill-up collars and knife collars and table rings, wrenches, etc.

1—Cowan Chain Saw Mortiser, equipped with full set of bars, sprockets and chains for ¼″, ⅜″ and ½″ mortises.

1—C.M.C. No. 624 Hand Feed Rip Saw Machine, with self-contained counter shaft, table 6′6″ long by 40″ wide, with plain box gauge, 22″ saw blades, 1¼″ arbor with cone for receiving saws different diameter.

1—Ballantine 8″ Four Sided Moulder, complete with square heads and straight knives on all spindles.

1—Goldie-McCulloch Single End Tenoner, roller carriage with single heads, double copes, no cut-off saw attachment.

1—Ballantine 16″ Buzz Planer with square cylinder, full set of knives and countershaft.

1—C.M.C. No. 646 Roller Table Cut-off Saw, sliding table 7′6″ long, stationary table 50″ to the saw sliding table equipped with stop gauge, including five stops, with countershaft, complete with saws, wrenches , etc.

1—Yates No. 156 27″ by 6″ Single Surfacer with solid roll and chipbreaker, full set of knives, wrenches and countershaft.

1—Cowan Combination Vertical and Horizontal Boring Machine, complete with bits, wrenches, etc.

1—Wood Frame Belt Sander, complete with roller table.

1—Hespeler 12″ Buzz Planer, fitted with round cylinder, full set of knives, countershaft, wrenches, gauges, etc.

1—Ballantine Tilting Table Double Arbor Saw Table, same as C.M.C. No. 616, arbor raising and lowering, fitted with full set of gauges, countershaft, saws, etc.

1—Preston 36″ Band Saw, spoke wheels top and bottom with saws, wrenches, etc.

1—McGregor-Gourlay Variety Saw Table with countershaft, attached, guard, gauges, tilting table, wrenches, etc.

8—Sections Cowan Four Screw Veneer Press 12″x50″, four sections 27″ clear space under screw plates, four sections 32″ under screw plates.

1—24″ Francis Double Roll Glue Spreader.

4—Sections Cowan Three Screw Veneer Press 38″x12″, 28″ clear space under screw plates.

1—American No. 4½ 36″ Cabinet Surfacer, with sectional rolls and chipbreakers.

1—American No. 26, 10″ Outside Moulder, 4″ side heads, latest type machine, complete with knife jointers and all equipment, new straight knives on all four heads.

1—C.M.C. Arm Sander, No. 438, with paper cutter.

1—Universal Knife Grinder, 37″, made by American Wood Working Machinery Co., Fig. 1126 in their catalogue.

1—60″ Sturtevant Single Slow Speed Exhauster, left hand, top vertical discharge, complete with platform and rods to suspend from ceiling.

1—45″ Sturtevant Double Slow Speed Fan, complete with platform and rods to suspend from ceiling.

1—50 H. P. Westinghouse Motor, 3 phase, 25 cycle, 550 volts, 720 r.p.m., with base and pulley, together with circuit breaker and starter

1—Pair 24″ Pulleys.

1—18″ Filing Vise.

1—Foley Band Saw Setter.

The last three items for use in sharpening small size Band Saws.

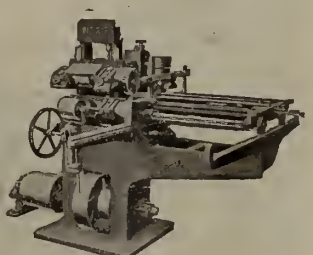
American No. 25 Power Feed Edging and Ripping Saw

Garlock-Walker Machinery Co., Limited

32 Front Street West

WINNIPEG TORONTO MONTREAL

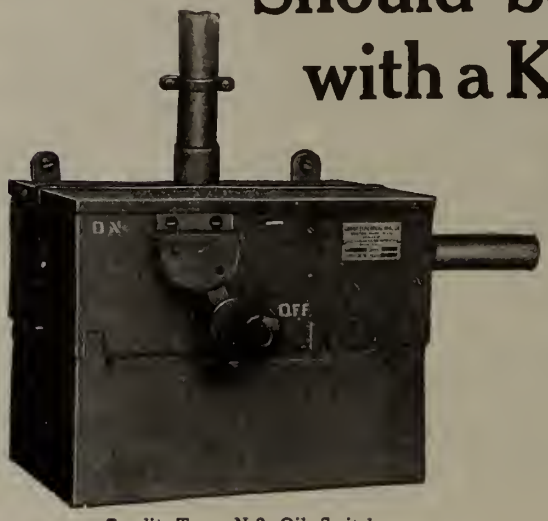
Everything in Woodworking and Metal Working Machinery



American No. 2½ Single End Tenoning Machine

CONDIT

No Power Circuit Should be Broken with a Knife Switch!



Condit Type N-2 Oil Switch

Condit Type I Oil Starter

By using Condit Oil Starters and small industrial Oil Switches to protect small motors and small power and lighting circuits in woodworking plants, the fire hazard is eliminated and many delays caused by trouble with small motors not properly protected, is avoided. When a circuit is opened, the arc is under oil which immediately extinguishes it. Thus, serious trouble very often caused by knife switch blades burning in ways which prevent proper contact and allowing a three phase motor to operate on single phase, is obviated.

Our Nearest House Can Supply You

Northern Electric Company
LIMITED

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Toronto London Windsor Winnipeg
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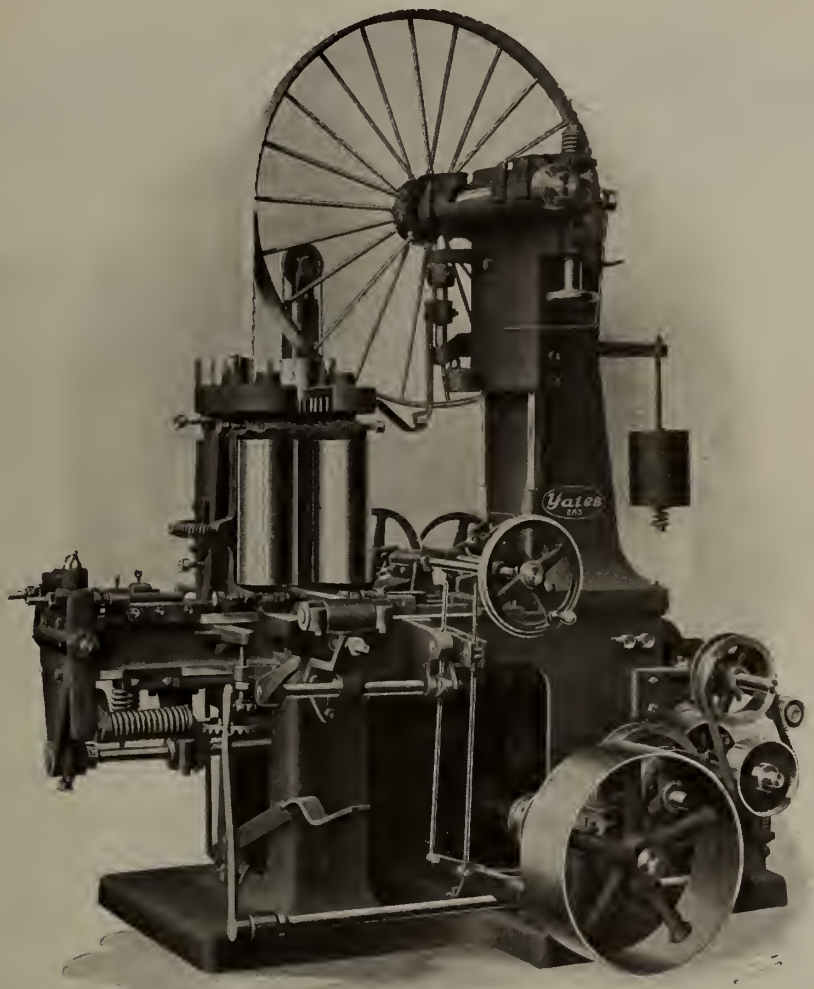
CONDIT: *the Synonym of Safety in Electrical Protective Equipment*

"Setting the Pace"



Yates

No. 283 Band Resaw

For Lighter Resawing in Furniture Factories

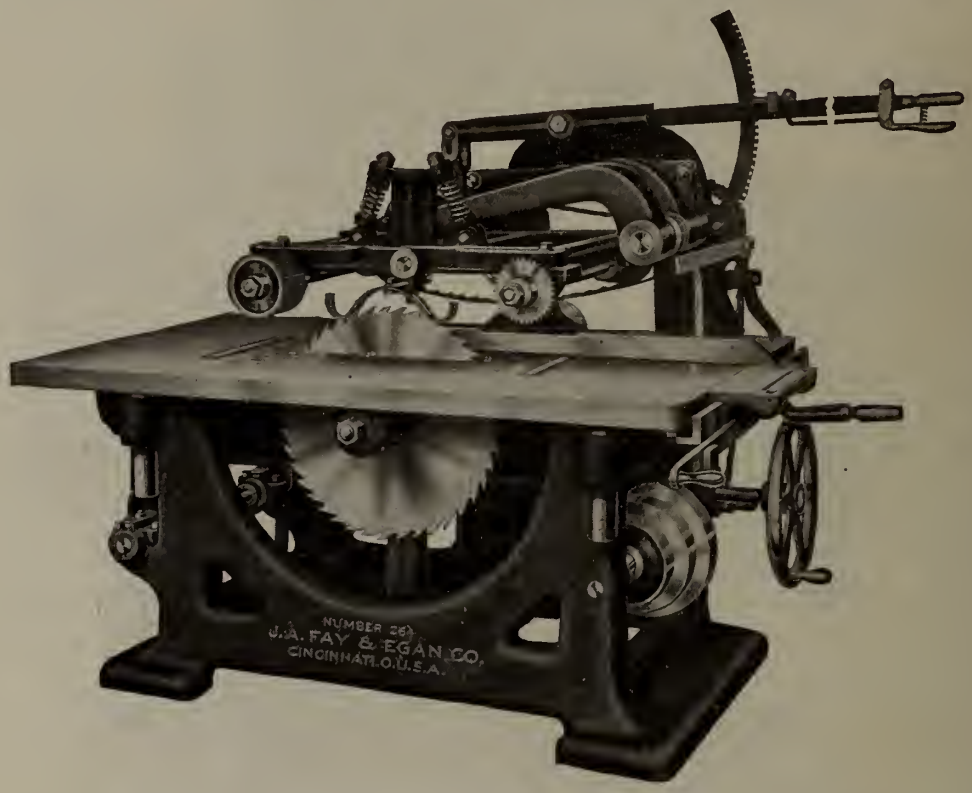
Where fine and accurate work is absolutely necessary the "283" for turning out this class of work has "set the pace" for many years. When it comes to "finish" it leads them all. One user says "The finish has been all that we could desire."

Have you seen the Yellow and Black Circular?
Sent gladly upon request — No obligation.

P. B. Yates Machine Co. Limited

Hamilton - Canada

A Modern Machine
for
A Modern Woodshop



No. 264 "Lightning" Self-Feed Rip Saw

For general ripping in planing mills, car shops, agricultural implement works, etc.

No. 264 is a modern high duty machine, suitable for light or heavy work.

Special attention is called to the adjustments, all of which are quickly made from operator's position, greatly facilitating the work and making a large output possible. It has two distinctive features, first table raises by worm segment on four heavy corner posts, insuring an absolutely parallel raise, and second a bearing is built into the center of the machine, supporting saw mandrel close to cutting point of blade.

SEND FOR BULLETIN P-20
FOR DETAILED INFORMATION

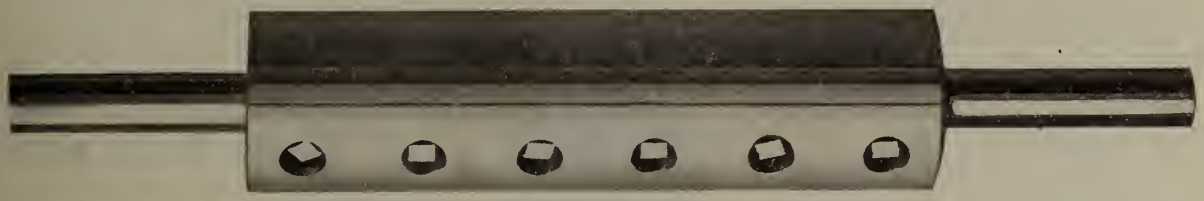
J. A. FAY & EGAN COMPANY

ESTABLISHED 1830

World's Oldest and Largest Manufacturers of Woodworking Machinery

153-163 West Front St. Cincinnati, Ohio

The Shimer Round Safety Cylinder With High Speed Knives



A Round Safety Cylinder that will appeal to the buyer and the user for three reasons:

The first is our adjusting nut for setting the knives. It is the only cylinder with properly located adjusting nuts for setting the knives, which, with our way, can be set to 1/1000 of an inch.

The second is our way of holding the knife without tapping into the head.

The third is the correct angle of cut for the knives.

Made for any of the different makers' machines and in any length of cylinder.

Write for Prices.

SHIMER CUTTER HEAD CO. OF CANADA, LIMITED

Manufacturers of Cutter Heads, Safety Cylinders and Grinders

GALT, ONTARIO

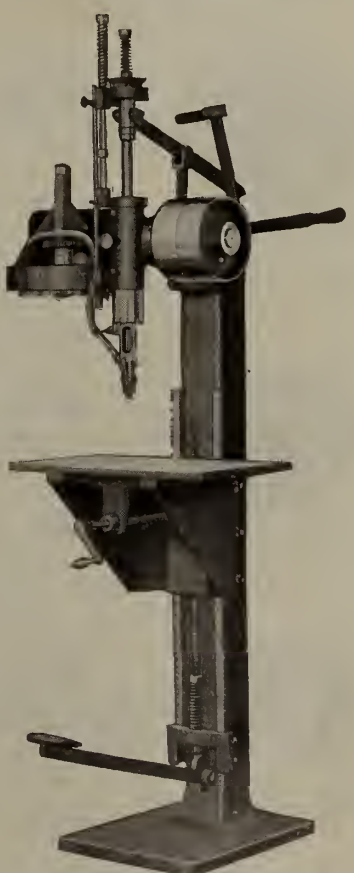
Drives 1000 to 1200 Screws per hour

—and cuts down labor costs 85%!

The Reynolds Screw Driving Machine with the Magazine Feed does not require a skilled operator. It is very simply handled—just dump a gross of screws (wood or machine) into the hopper. The machine does the rest.

Send us the outside dimensions of your work, also gauge and length of screws and we will gladly quote on your requirements.

Write us now. Every day you put it off means unnecessary expense in your shop.



The Reynolds Machine Co.

Department C

Massillon, Ohio, U. S. A.

WEST SIDE IRON WORKS

1220-1227 WASHINGTON BLVD. CHICAGO, ILL.

Manufacturers of Motor Driven and Ball Bearing Band Saws

Steel Wheels

Guide above and below table

Saw Guard

Direct Motor Drive

Motor with Gear

Motor with Belt Drive

MOST COMPLETELY EQUIPPED BAND SAW ON THE MARKET

THE VERY BEST

14 in., 36 in., 42 in. BAND SAWS AND 42 in. BAND RIP

THREE GUESSES

Is it economical

Is it the right type

Is it the right size

Electric power, heating, lighting and equipment problems are to be found in the woodworking industry.

Perhaps your output can be increased? You are, perhaps, losing electrical energy by wasteful types of motors? Are your switches and wiring devices up-to-date or are you in continual danger of fire?

We shall be pleased to answer any questions or help you with any problems whenever you care to write us.

Twice Monthly **Electrical News** $2.00 per year

347 Adelaide St. West., TORONTO

Please send the "Electrical News" to the undersigned until further notice, for which find enclosed Two Dollars, being One Year's Subscription in advance.

Name .....

Address .....

C.M.C.

No. 640 ROLLER CARRIAGE CUT-OFF SAW

This Saw is designed for rapid cutting off of light stock, and is particularly adapted for such work in the furniture, cabinet, sash, door and box factory.

It is very easily operated. The table which is 60″ x 40″ and made of well seasoned hardwood strips braced to prevent warping, is mounted on four rollers on the top of the frame. These rollers operate with the greatest ease and are arranged to hold the table square with the saw in any position.

The fence, extending the full length of the table, is fitted with a clamp to hold a stop to facilitate the cutting of the stock to any desired length.

Let us send you bulletin of this saw.
Full particulars and prices on request.

CANADA MACHINERY CORPORATION
LIMITED

GALT, - ONTARIO

"Treat Your Machine as a Living Friend."

A Canadian-Made Product

"PRESTON" No. 132 36 in. BAND SAW

View Shows machine guarded with bottom iron doors open

SPECIAL FEATURES

1.—All Steel Wheels covered with solid rubber bands ¼" thick.

2.—Perfect Tension Device and style of guide that, combined, reduce saw-breakage to a minimum.

3.—Universal alignment of wheels.

4.—Convenient adjustments. Smooth, steady operation.

5.—Supplied with 3 H.P. Electric Motor for individual drive if desired.

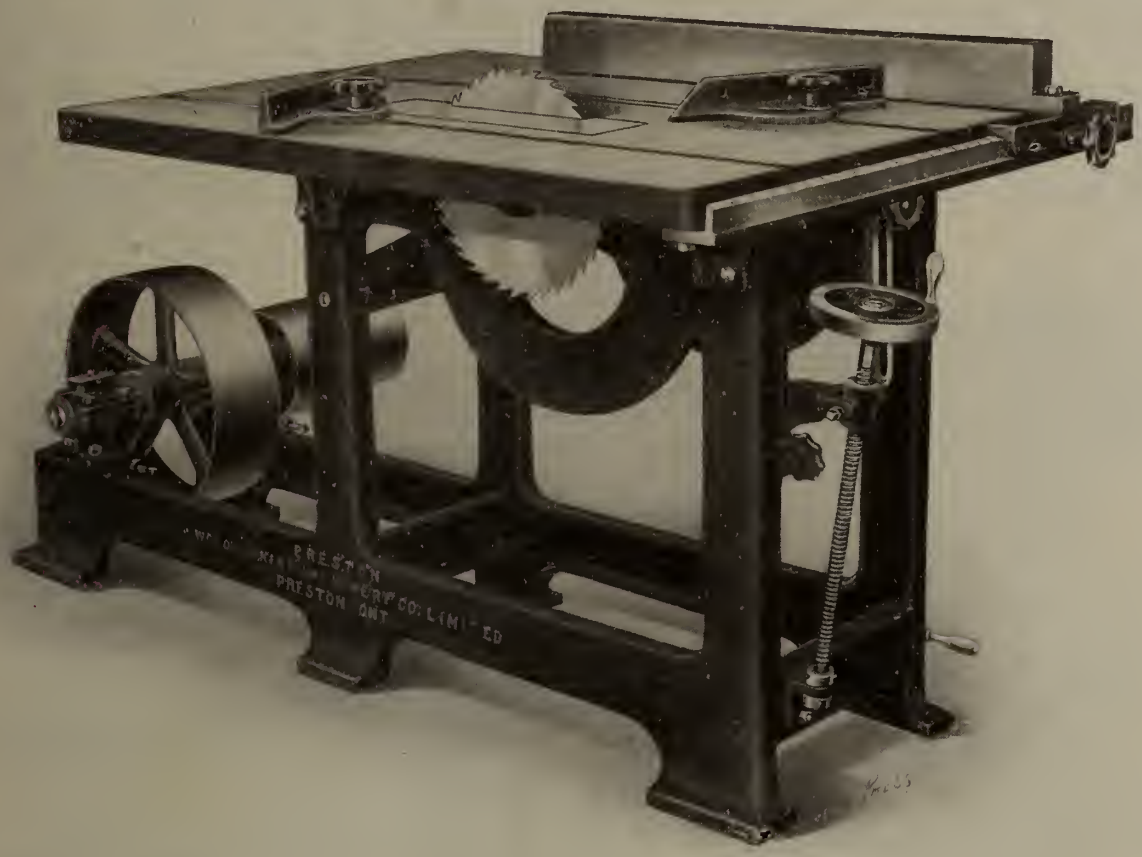
6.—Supplied with SKF Ball Bearings in upper and lower wheels if desired.

HAS FEW EQUALS—NONE ARE BETTER
Write for descriptive pamphlet and prices

The Preston Woodworking

PRESTON

A Simple, Practical Machine
For Fine Accurate Work



No. 125.—TILTING TOP SAW TABLE

Frame Cast in One Piece. **Easy and Rapid Adjustment of Saw.**
Special Locking Device. **Belt Tightening Bushes on Countershaft.**
Arranged for Individual Motor Drive if Desired.

This Engraving represents a new Rip and Cut Off Saw Table, a medium sized machine, convenient for Dadoing, Grooving, Rabbeting, Mitreing, Bevelling, Etc. It is intended especially for fine and accurate work on Furniture, Sash and Door, Cabinet, Pattern and General Woodworking Shops. The design is simple and practical and the construction is high-class throughout.

The Frame is cast in one solid piece making it rigid and strong. The Table is planed perfectly true and has a removable wood throat plate allowing extra thick saws or Dado Heads to be used. The machine will carry saw blades up to 14" diameter.

A Boring attachment or a Boring and Mortising attachment with a wood table, can be furnished with this machine, if desired.

WRITE FOR BOOKLET AND PRICES.

Machinery Company, Ltd.
ONTARIO

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36" Band Saw 311

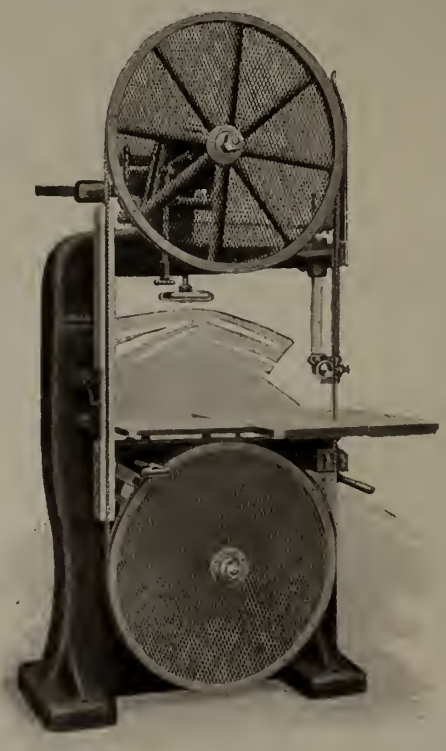
Solid Lower Wheel

Knife Edge Tension

Tilting Table

45 to Right, 7 to Left

Carries Saws ¼" to 2"



Circular Guards

Complete Protection
All Parts Visible

Top Guard Adjusts
With Wheel

Guards Not Disturbed
When Changing
Saws

COWAN & COMPANY OF GALT LIMITED

GALT - ONTARIO

Will do the work of Five Hand Jointers in making Glue Joints

This is the guarantee given with our

No. 4 Continuous Feed GLUE JOINTER

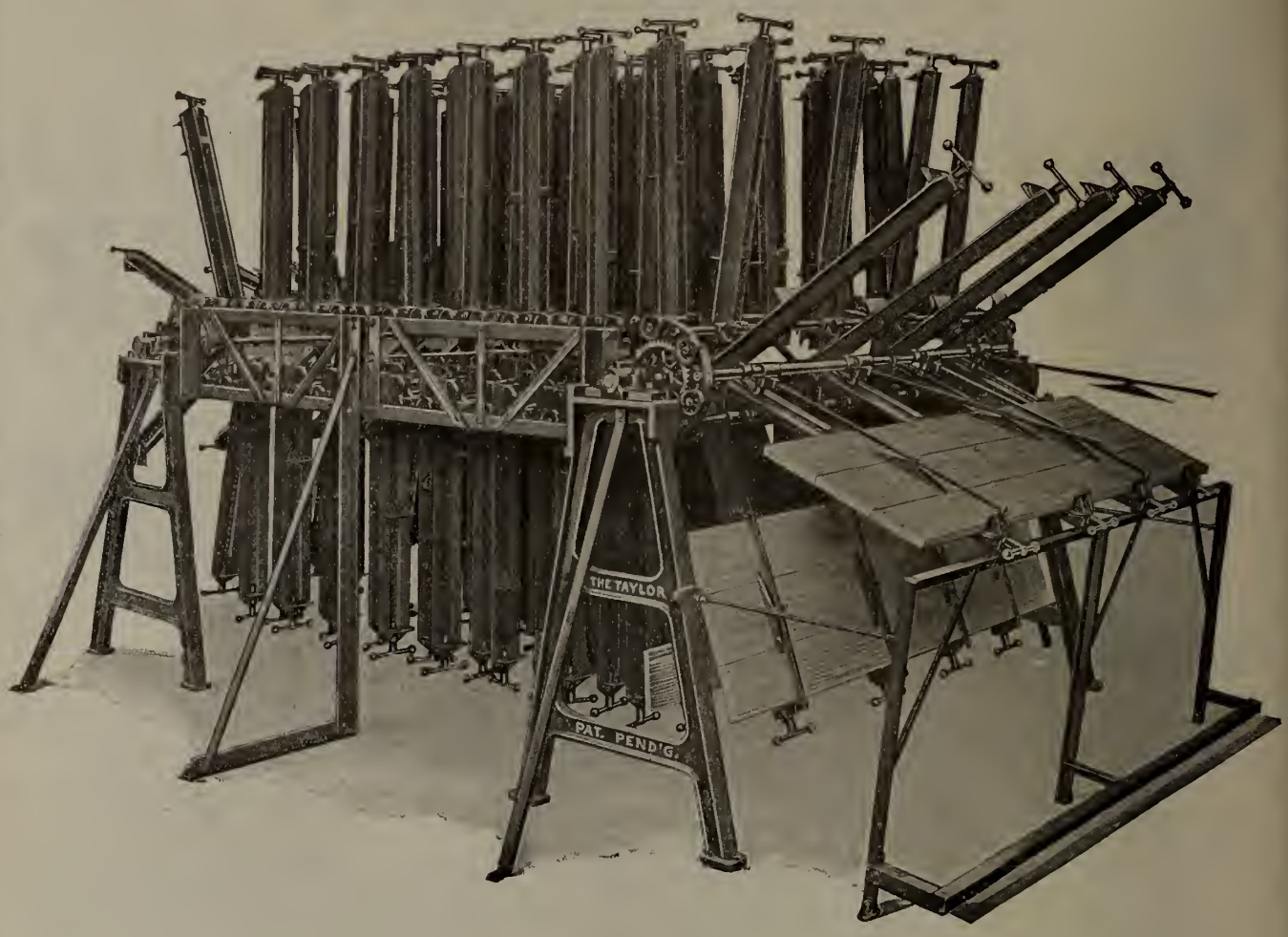
Strongest and most complete machine on the market.
Any part may be readily removed or renewed.
Feeds in opposite direction, giving 100 feet per minute.
Works material from six inches up to any length desired.
Also from one quarter to 3 inches thick, and from three-quarters of an inch wide up to any width.
1 set Shimer Special Jointer Heads supplied with machine.

Investigate the merits of this machine—it will pay you!

Jackson, Cochrane & Company

KITCHENER - CANADA

CLAMP The Taylor TRADE MARK CARRIER



Forty section machine carrying 160 clamps, measuring 8 ft. 2½ in. between shaft centers.

The clamp is one of the most interesting features of the clamp carrier. A remarkable strain can be applied with greatest ease; the work it turns out—both thick and thin stock—is 100 per cent. perfect.

An Engineering concern recently wrote:

"I am recommending Taylor clamps to the Germain Mfg. Co. because I have proven the clamps more efficient through scientific time studies on both and all existing types of gluing-up machines and devices."

As a result of the above recommendations, The Germain Mfg. Co. referred to bought two Taylor carriers. They installed them, and tested them and have since purchased two more. We can tell you numerous instances where customers are using from two to nine Taylor carriers each as a result of similar experiences.

Let us prove the truth of these claims by showing you one of these carriers in operation, or you can try the clamps out on your own work. Ask for C. C. Folder and further information.

A. R. Williams Machinery Co., Toronto, Canada — Representatives

James L. Taylor Manufacturing Co.

POUGHKEEPSIE, N. Y.

EAGLESFIELD

"Beltless" Swing Saw

Adaptable to close, accurate work

The "Eaglesfield" is the result of very careful study of swing saw requirements, and is designed with a special view to economy, reliability of operation and compactness.

This saw is operated by a specially designed and rated four-horsepower motor, the transmission being direct to the saw mandrel through a set of bevel gears, both saw mandrel and motor shaft being supported in S.K.F. ball bearings.

The hanger is of unified construction to insure rigid support and eliminate vibration. A rocker coil spring is provided instead of the ordinary counter balance weight.

The motor which is mounted in, and forms part of the head, is supplied in 60 cycles, either 2 or 3 phase, and any standard voltage. Speed of motor is 3,600 R.P.M.

One circular saw, which will cut five-inch stock, is included with each machine.

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21st and Norwestern Avenue

Indianapolis, - Indiana

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"Williams" Woodworking Machinery

If It's Machinery—Write "WILLIAMS"

An Exceptional Opportunity to Save Money on High Grade Woodworking Machinery

We have just purchased the complete equipment of the NORTH BAY TOY COMPANY, which was very slightly used, consisting of YATES Moulders, Straight Edge Rippers and Shapers, MATTISON and WAYMOTH Variety Lathes, PRESTON High Speed Ball-bearing Shapers and Band Saws, and a number of other well-known high grade lines.

Send us your list of requirements or phone Woodworking Dept., Ad. 20.

THE PRICES ARE ATTRACTIVE

The A. R. Williams Machinery Co., Limited

64 FRONT ST. WEST - TORONTO

Phone Woodworking Machinery Dept., Adelaide 20

Full lines of Iron and Wood-Working Machinery, Boilers, Engines and Contractors' Machinery, Electric Motors, Saws, Shingle and Lath Mill Machinery, etc

HALIFAX, N.S. ST. JOHN, N.B. MONTREAL, P.Q. TORONTO, ONT.
VANCOUVER, B.C. WINNIPEG, MAN.

Steam you must have—

It follows that you must use Boilers specially designed for your work—economical of fuel, easily cleaned, built in a shop replete with every MODERN facility. That describes our Boilers. We can supply your need promptly and satisfactorily.

Engineering and Machine Works of Canada, Limited

St. Catharines, Ont.

Eastern Sales Offices:
Hall Machinery Co., Sherbrooke Que., and Birk's Bldg., Montreal.

Made From Selected Grade Crucible Steel

Radcliff Saws are the climax of saw efficiency. In the sawmills, box factories and woodworking shops they are the first choice of workmen who know what quality in saws signifies when there is a big cutting job ahead.

"Beaver" Brand Saws

There is no equal to a "Beaver" Brand Saw unless it is another "Beaver" Brand Saw. Made from selected Swedish Crucible Steel—they lead the way.

Write for particulars and prices.

Radcliff Saw Manufacturing Company, Limited

1550 Dundas Street West TORONTO, ONT.

AGENTS FOR L. & I. J. WHITE CO., MACHINE KNIVES

This "Oliver" Hand Planer and Jointer

is installed in the plant of a prominent manufacturer in Waterbury, Connecticut, where they're working their wood faster and better than ever before—on

"Oliver" Wood-Working Machinery

The operator here is planing on an "Oliver" Hand Planer and Jointer with the cutter running at 4000 r.p.m. This machine was installed in October, 1917, has given A1 service, and is still in first class condition.

The "Oliver" Line embraces:

Saw Benches	Sanders
Swing Saws	Mortisers
Band Saws	Trimmers
Surfacers	Grinders
Jointers	Vises
Lathes	Glue Heaters

Oliver Machinery Co.
Grand Rapids, Mich.,
U. S. A.

Subscribers' Information Form

Many letters reach us from subscribers enquiring where certain goods can be obtained. We can usually supply the information. We want to be of service to our subscribers in this way, and we desire to encourage requests for such information. Make use of this form for the purpose.

Date.....19

"CANADIAN WOODWORKER"
345 Adelaide St., West, Toronto

Please tell us where we can secure (give description as fully as possible) .....

.....

.....

.....

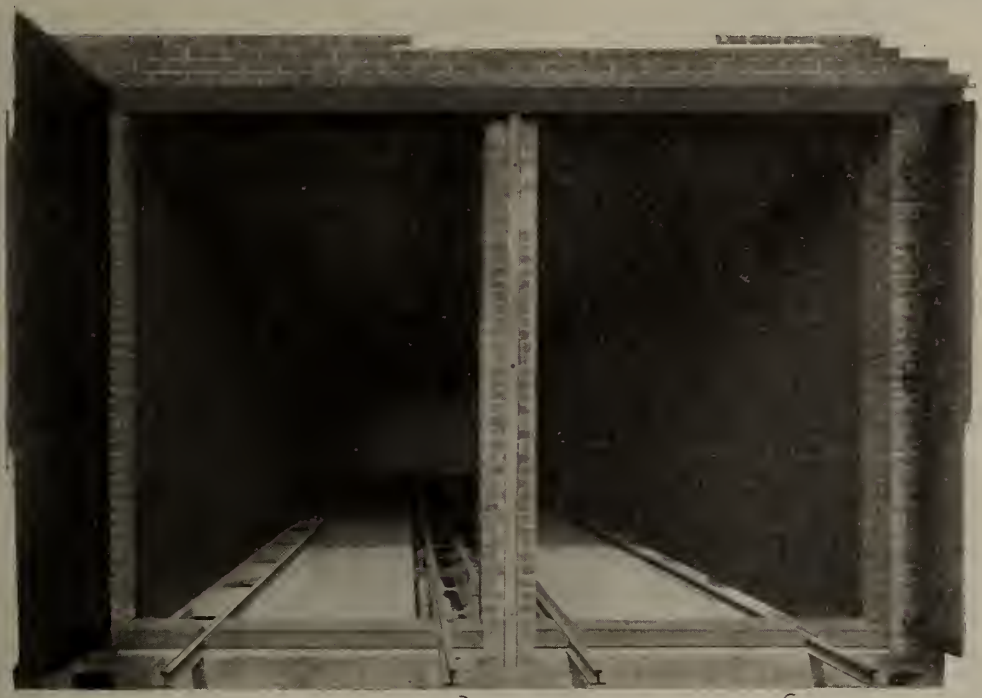
Name .....

Address .....

Cutler TRADE MARK

KILNS

New Principles of Lumber Drying



One Kiln Does the Work of Two

REAL ECONOMY

One Cutler Kiln does the work of two of any other make of equal size and does it better. This means that you buy but half the number of Cutler Kilns, save half the buildings, ground space, labor, handling equipment, cost of operation, supervision, and get a better quality of lumber. These are the facts which make the **Cutler System** so genuinely economical. These results are the direct effect of correct kiln design based on an accurate knowledge of the fundamental principles of drying lumber, on a thorough understanding of the mechanical features of all dry kilns and on nearly one hundred years of intensely practical experience in the drying of Lumber.

Write us for our solution of your lumber drying problems and our catalog "Economy"

DRY KILN DEPARTMENT of CUTLER DESK COMPANY

Drying Specialists - Buffalo, N.Y., and Bridgeburg, Ont., Mentholatum Bldg.

Pacific Coast Division:

W. B. Hawksworth, Manager, Office: Babcock Bldg., 310 California Street, San Francisco California

HART MIRROR PLATE CO.

IMPORTERS AND MANUFACTURERS OF

MIRRORS

GRAND RAPIDS QUALITY

Grand Rapids, Mich.

A great many Hart craftsmen have made Hart Quality Mirrors for 20 years. Moreover, they learned their trade in Europe. Old World skill with New World methods means Grand Rapids Quality Mirrors at quantity production prices. Hart Mirrors are finely finished in every respect and shipped with unusual promptness.

Makers of Highest Grade Mirrors and Plate Glass Tops Since 1900

GLUE

FOR THE FINEST CABINET WORK AND VENEERING.

Suitable for All Climates.
Great Strength & Light Colour.

SAMPSON & WHITE, Ltd.

6, HOLBORN VIADUCT, LONDON, E.C.

MILL PIPING

Shaving and Sawdust Collecting Systems Installed Complete

ALTERATIONS—REPAIRS

Neville-Cooper Co.
130 Ontario St. Toronto
Phone Main 2157

We also manufacture and erect Smoke Stacks, Boiler Breechings, Metal Cornices, Skylights, Eavetrough, etc.

"CASCO" Waterproof Glue

Mixed Cold—Used Cold

COST

FOR JOINTING—very much less than the hide glues.

FOR VENEERING—A little more per pound than vegetable, but little, if any, more per GLUE LINE FOOT.

Hundreds of large manufacturers are using "CASCO" to produce the BEST veneered products, at no increase in cost.

The Casein Manufacturing Co.
Manufacturers of Casein Glues for twenty-five years
15 PARK ROW NEW YORK CITY

NOTE. Send for Casco Red Book. It contains much information on glue, veneer and panels.

Built on Fireless Cooker Principle

"INTERNATIONAL" Electric Glue Heaters

like the fireless cooker are built on the principle of retaining heat.

There is no water bath to boil dry and cause burnouts on the International.

Even dry heat means more accurate temperature control and a lower energy consumption.

The quart pot operates at an average cost of one cent per day.

Over 10,000 satisfied users

Write for folder, "Correct Temperature in the Glue Room."

INTERNATIONAL ELECTRIC COMPANY
MANUFACTURERS
ELECTRICAL HEATING APPLIANCES
INDIANAPOLIS, U.S.A.

Canadian Distributors

R. E. T. PRINGLE, Limited

TORONTO
95 King Street East
MONTREAL
401 New Birks Bldg.
WINNIPEG
703 Confederation Life Bldg.
VANCOUVER
402 Vancouver Block

"International Electric Heaters are Better."

QUICK REPAIR

For repairing splits, checks and other defects in face veneers. Made in colors to meet the requirements of the best finishes of all cabinet woods.

Put up in tubes for convenient use on surface stock and in quart cans for larger defects in core stock.

QUICK REPAIR has been used by some of our customers for a number of years.

Small sample tube mailed free on request.

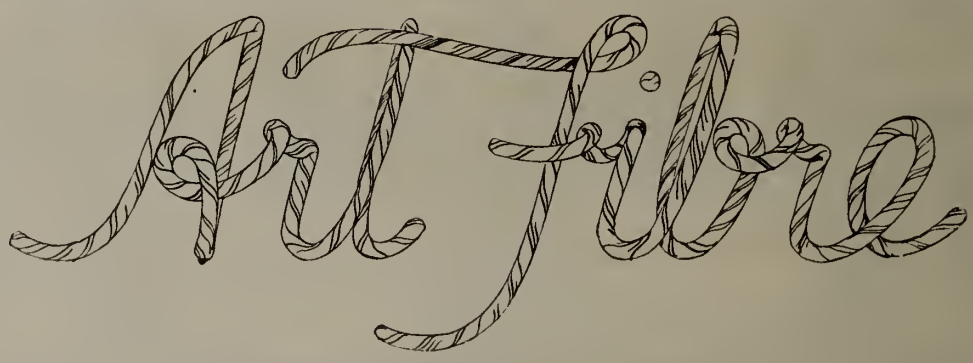
Manufactured and sold exclusively by
Makers of

PERKINS
183
Trade Mark Reg. U.S. Pat. Off.

Perkins Glue Company

Factory and General Offices:
Lansdale, Pennsylvania.

Sales Office:
South Bend, Indiana



Strong, uniform and economical weaving material is exactly what every fibre furniture manufacturer wants.

Art-Fibre Cord and Art-Fibre Stakes fulfill these requirements in every detail.

Art-Fibre is made from stock especially adapted for taking stains and enamels. Unexcelled smoothness of finish is assured in your product when Art-Fibre is used.

Flat Fibre, Cord and Stiff Stakes with or without wire centers are furnished in natural and brown color.

Manufacturers of upholstered furniture should know about Unaflex Seaming Cord. A uniform, flexible and economical cord for upholstered furniture.

Write for Samples and Prices.

GRAND RAPIDS FIBRE CORD CO.

GRAND RAPIDS MICHIGAN

Perkins Vegetable Glue

PERKINS 183 was the FIRST VEGETABLE GLUE ever sold to high grade wood working concerns and PERKINS 183 is now the last word to be said of a HIGH GRADE, UNIFORM QUALITY, GLUE. Much money and effort have been spent on work covering a period of years; many changes were made in the formula until the present manufacturing process of 183 was reached and for fourteen years this glue has successfully filled the requirements of HIGH CLASS GLUE. Both our research and factory laboratories are constantly working to improve manufacturing methods and we shall never be satisfied to give the trade anything less than the best.

Numerous opportunities come our way to cheapen our product by making short cuts in our manufacturing process thus allowing us to sell at a lower price. We do not do this because the Trade would pay the bill first and later we would suffer in loss of trade.

The Home of

PERKINS 183

TRADE MARK (Reg. U.S. Pat. Off.)

Our Canadian Factory is located at Hamilton, Ont.

The Name to Go By When You Go to Buy
Its First Cost Is Its Last Cost

Process and Product Patents covering Perkins Glue were granted July 2nd and March 19th, 1912, and have been held valid and infringed by the United States Circuit Court of Appeals. Patents have also been granted in Canada, Great Britain, Germany, France, Belgium, Italy and other foreign countries.

PERKINS GLUE COMPANY

Factory and General Offices:
Lansdale, Pennsylvania

Sales Office:
South Bend, Indiana

Do Not Gamble on Your Veneer Tapes

BUY THE BEST.

Ideal Veneer Tapes

The material with the guarantee behind it

Profit by our many years' careful application to the subject of Veneer Tapes.

We have several qualities, cloth and paper, plain and perforated, which will cover all of your requirements.

Write for booklet.

IDEAL COATED PAPER CO.

Veneer Tape Specialists

Main Offices and Mills, BROOKFIELD, Mass.

MAGIC VENEER TAPE

is made of highest quality Kraft Paper that peels off your veneer in one piece, thus eliminating that tedious and expensive work of sanding or scraping.

YOUR especial needs of Veneer Tapes, whether Paper or Cloth, can be furnished by

The Gummed Products Co.

Troy - Ohio

Chicago Minneapolis New York

CANADIAN·NASHUA·PAPER·CO·LTD
SERVICE PRODUCTION NASHUA QUALITY
TRADE MARK
PETERBOROUGH ONT.

NASHUA Veneer Tapes

Are manufactured with a view to giving the consumer the material for his purpose, and we stand ready to develop any special requirement for you.

In purchasing our tapes, you are assured of prompt service, guaranteed quality and a reasonable price.

Samples of our stock will be sent upon request, so that you may try them out in your plant in a practical way.

CLOTH and PAPER Guaranteed Veneer Tapes

THE CANADIAN NASHUA PAPER CO., Ltd.

Peterborough, Ont.

An Efemco Product

The Caster that "Stands the Gaff"

The steel horn and all 'round sturdy construction of this Acme Grip Neck Ball Bearing Caster makes it resistant to heavy loads and tilting strains. Its rugged top prevents the balls from binding or working out.

Here's an EFEMCO Product, from A to Z, and you're selling easier rolling and smoother action—as well as dependability—with every piece of furniture you equip with this caster.

Non-plated, brass-plated and nickel-plated finish. Sizes 3, 4, 5, 6, 7 and 8. With Maple, Lignum Vitae, Steel, Iron or Fibre wheels.

Write for catalog showing new lines of improved EFEMCO Casters.

FOSTER, MERRIAM & CO.

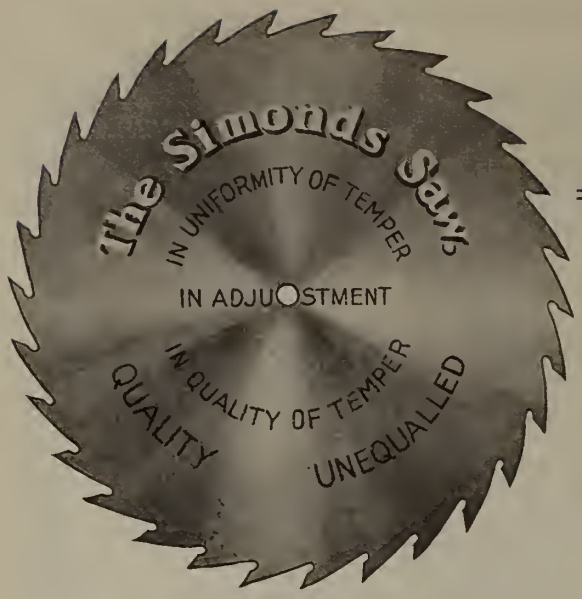
Meriden, Conn. Hamilton, Ontario New York City

Efemco PRODUCTS

Grip Neck Casters
Ball Bearing Casters
Roller Bearing Casters
Truck Casters
Furniture Trimmings
Automobile Accessories
Piston Rings
Grey Iron Castings

Efemco Products Efemco Products Efemco Products Efemco Products Efemco Products Efemco Products

Standardized by 85 years of service



SIMONDS CIRCULAR AND BAND SAWS

In every mill or woodworking shop in the land the demand for greater production is urgent. Devious methods to secure the desired results are being tried out. Some are making good—some are not. They have the manpower, but they can't get production. Many mills and woodworking shops have discovered one of the greatest hindrances to efficient operation are poor saws and knives. The saws dull easily and do not hold their tension, while the knives lose their cutting-edge quickly and this results in unsightly marks on the lumber, and consequently damage.

Inferior saws and knives are being discarded by many, and in most cases Simonds Products are replacing them. There is no question about Simonds Saws and Knives. They are made of the finest steel obtainable, hardened and tempered right and make mechanically perfect. They produce smooth lumber and cut down your operating expense.

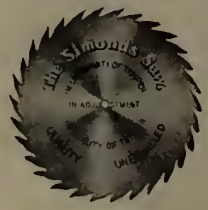
Write for catalog and prices.

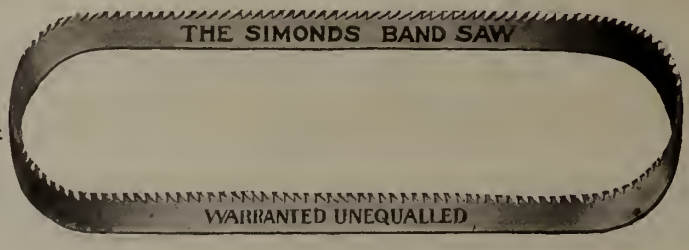
Simonds Canada Saw Co., Limited

"The Saw Makers"

MONTREAL, Que.

VANCOUVER, B.C. **ST. JOHN, N.B.**



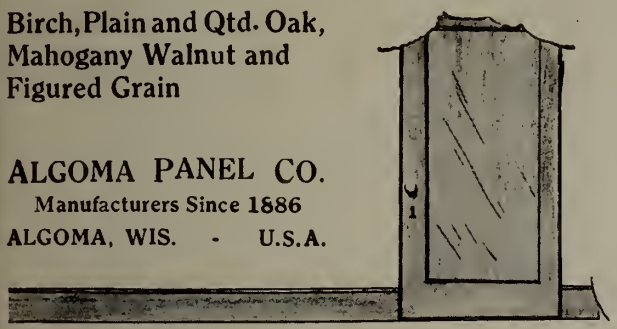


ALGOMA
PANEL COMPANY

We manufacture from the log to the finished panel

Specialize on
DOOR PANELS, FURNITURE AND FIXTURE PANELS

Birch, Plain and Qtd. Oak, Mahogany Walnut and Figured Grain



ALGOMA PANEL CO.
Manufacturers Since 1886
ALGOMA, WIS. - U.S.A.

BOX NAILS and WIRE for Every Use

We manufacture a complete line of nails and wire in every style and size. Your special needs can be supplied. Write us today. We manufacture special styles to order.

Laidlaw Bale-Tie Co., Ltd.
A. T. Diggins, Toronto, Ont. H. E. O. Bull, Montreal, Que.
Harry F. Moulden & Sons, Winnipeg, Man.
Mr. Norman Jessiman, 505 Hastings St. W., Vancouver, B.C.
Head Office and Works: HAMILTON, CANADA

Subscribe for the
Canadian Woodworker
and
Furniture Manufacturer
Only $2.00 per year

VENEERS DOORS PANELS

Neenah Blue Diamond Wood Products

ROTARY CUT SINGLE PLY GUM and POPLAR

DESK and TABLE TOPS in all WOODS

THREE and FIVE PLY PANELS in all WOODS

VENEERED and SOLID DOORS STANDARD and SPECIAL

Manufactured by

Hardwood Products Company

NEENAH, WISCONSIN

Reese Sheriff Lumber Co.

WILLIAMSPORT, PENNSYLVANIA

Manufacturers of

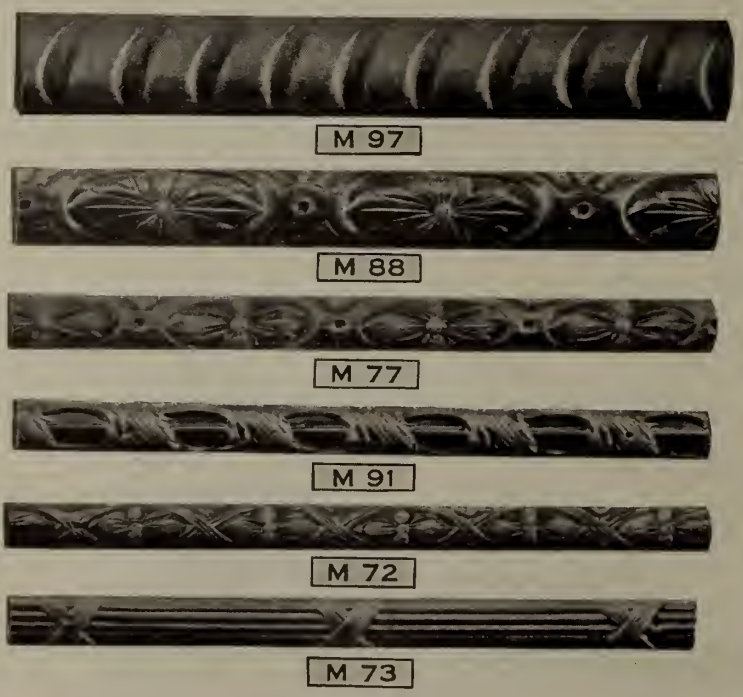
Northern and Southern Hardwoods White Pine, Spruce and Hemlock

With special attention to **Oak, Chestnut, Poplar, Cherry, Walnut, Gum and Basswood.**

OUR MOTTO

REASONABLE PRICES – that you can afford to pay.
EFFICIENT SERVICE — that you have a right to expect
FAIR TREATMENT — that you can depend on getting

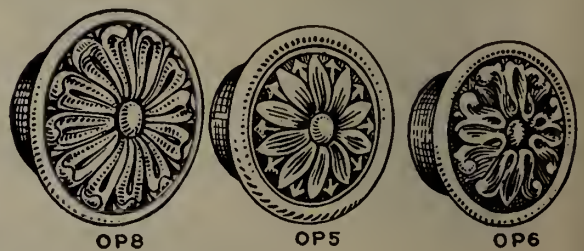
We would appreciate an opportunity of furnishing a portion of your lumber requirements.



MOULDINGS We are making more Period Mouldings than ever before. Orders should be placed early to assure your supply when needed.

KNOBS The Period Knobs we placed on the market a few months ago are proving very popular. If you have not received samples ask for them now.

ROSETTES A new Period item to accompany the knobs.



Waddell Manufacturing Company

Coldbrook and Taylor, N. W. **Grand Rapids, Mich.**

ESTABLISHED 1867 INCORPORATED 1886

OTIS MAHOGANY

Brought from the inland recesses of the tropics, from the thick matted jungles where vivid flowers, and magnificent orchids grow in riotous profusion, where monkeys chatter incessantly, and birds of beautiful plumage dwell and strange creatures cry out in the night.

These piles represent the toil of natives of the jungle, and many miles of ocean travel to the land of the white man.

Here you find

Tabasco, Laguna Honduras and Mexican Mahogany

The Otis Mills are always assured of an adequate supply. With a capacity of 12,000,000 feet per year, we are well prepared for any and all demands. Write for our prices to-day.

Otis Manufacturing Company

Peters Avenue and The River

NEW ORLEANS, LA.

Chicago Office: 175 W. Jackson Blvd.

L. D. LEACH & COMPANY

FISHER BUILDING, - CHICAGO, Ill.

Manufacturers Hardwood Lumber

6 Cars 4/4 No. 1 Common Red and White Oak
5 Cars 4/4 No. 2 Common Red and White Oak
4 Cars each 8/4 in. No. 1 and No. 2 Com. R. and W. Oak
2 Cars each 10/4 in. and 12/4 in No. 1 and No. 2 Common Red and White Oak

Oak Furniture — Vehicle and Car Stock Dimensions Sawed to Order

4/4 in. Gum—All Grades
4/4 in. Cypress—All Grades
4/4 in., 8/4 in. and 10/4 in. Log Run Soft Elm

HARDWOOD LUMBER

Thirteen Band Mills
Six Planing Mills
Eleven Flooring Units

Annual Capacity, 130,000,000 Feet

Lumber generally is now being sold by the producer at less than the cost of production.

We have closed all our sawmills and planing mills.

Our yards are full.

Consumption of lumber is slow.

Authorities say that stocks of lumber in the hands of dealers and consumers are far below normal.

Everyone knows the extent of the arrearage in building and construction lines.

The subnormal consumptions of the past must be made up, sometime in the future by an extra or abnormal consumption.

These fundamental facts are so plain, and the deductions therefrom so obvious, that we would doubt the value of the business of any one who required to be told, the obvious thing to do under present conditions.

No one can doubt the wisdom of buying at present figures. Conditions, however, are such that consumers are and will be more exacting in respect to quality and service.

OUR LUMBER IS UNSURPASSED IN INTRINSIC QUALITY;
OUR MANUFACTURES ARE STANDARD;
OUR SERVICE IS THE SYNONYM OF EFFICIENCY.

W. M. Ritter Lumber Co., Columbus, Ohio

Canadian Representative: **John Hall, 160 Huron St., Post Office Box 32, Toronto**

Mercerau-Hawkins Tie Company

Huntington - W. Va.

Manufacturers and Wholesale Dealers

West Virginia and Southern

HARDWOODS

We specialize in

Oak Tie Siding
White and Red Oak
Yellow Poplar
Basswood
Chestnut and
Gum Lumber.

Canadian Sales in Charge of

C. W. PETERS

Vice President and Manager of Lumber Dept.

RUSH LUMBER COMPANY

Manufacturers Southern Hardwoods

Band Mill and Office - Memphis, Tenn.

ASH
2 cars 5/4 No. 2 Com. & Btr.

CYPRESS
1 car 4/4 Shop & Btr.

ELM
3 cars 6/4 Log Run
1 car 8/4 Log Run
1 car 12/4 Log Run

PLAIN RED GUM
1 car 4/4 Com. & Btr.
1 car 5/4 Com. & Btr.
2 cars 4/4 No. 1 Common
2 cars 4/4 No. 2 Common

QTD. RED GUM
2 cars 4/4 No. 1 Common
1 car 6/4 F.A.S.
1 car 6/4 No. 1 Common
1 car 8/4 Com. & Btr.

QTD. RED GUM S.N.D.
2 cars 8/4 No. 1 & Btr.
1 car 10/4 No. 1 & Btr.
1 car 12/4 No. 1 & Btr.

PLAIN SAP GUM
1 car 4/4 F.A.S.
3 cars 4/4 No. 1 Com.
3 cars 4/4 No. 2 Com.
2 cars 4/4 No. 3 Com.
1 car 5/4 Com. & Btr.
2 cars 5/4 No. 2 Com.
1 car 5/4 No. 3 Com.

QTD. BLACK GUM
3 cars 4/4 No. 1 Com. & Btr.
1 car 4/4 No. 2 Com.

PLAIN BLACK GUM
1 car 4/4 Log Run

HICKORY
1 car 6/4 Log Run

QTD. WHITE OAK
2 cars 4/4 No. 1 & Btr.
3 cars 4/4 No. 1 Com.
1 car 4/4 No. 2 Com.
1 car 4/4 2½ to 5½ Cl. Strips
1 car 4/4 1½ to 3 Com. Strips.
2 cars 5/4 No. 1 & Btr.
1 car 6/4 No. 1 Com.

PLAIN WHITE OAK
3 cars 4/4 No. 1 Com.
1 car 4/4 No. 2 Com.
1 car 4/4 No. 1 Com. & Btr. Sound Wormy
1 car 5/4 No. 1 Com. & Btr.
1 car 5/4 No. 1 Com.
1 car 6/4 No. 1 Com.
1 car 5&6/4 No. 3 Com.

PLAIN RED OAK
3 cars 3/4 No. 1 Com. & Btr.
1 car 4/4 No. 1 Com. & Btr.
3 cars 4/4 No. 1 Com.
2 cars 4/4 No. 2 Com.
2 cars 5/4 No. 1 Com. & Btr.
1 car 5/4 No. 1 Com.
1 car 6/4 No. 1 Com. & Btr.

POPLAR
1 car 4/4 F.A.S.
1 car 4/4 Saps & Select
2 cars 4/4 No. 1 Com.
2 cars 4/4 No. 2 Com.
1 car of Dogboards.

Dacus-Richards Hardwood Co.

A. P. DACUS - H. J. RICHARDS

MANUFACTURERS

Southern Hardwood

Specializing in

RED GUM
SAP GUM

PLAIN AND QUARTERED

OAK

Randolph Building,
Memphis, Tennessee.

Mills at EVANSVILLE, Miss., and PRITCHARD, Miss.

Perkins Brothers

Kelso, Ark.

Manufacturers of

Southern Hardwoods

Quartered and Plain White Oak, Plain Red Oak, Gum Elm, Maple, Ash and Cypress

We are also prepared to cut dimension stock to order in Ash, Oak, Gum, Hickory and Elm.

Let us know your requirements.

Brown & Hackney, Inc.

MEMPHIS, TENN.

BAND MILL: LITTLE ROCK, ARK.

Manufacturers of High Grade

Band Sawn Southern Hardwood

LUMBER

General Office:

Bank of Commerce Bldg. Memphis, Tenn.

February 1921—Stock List

QUARTERED WHITE OAK

2 cars	5/8"	No. 1 Common	
2 cars	4/4"	1s&2s	
5 cars	4/4"	No. 1 Common	
2 cars	4/4"	No. 2 Common	
2 cars	4/4"	Common Strips	
7,000'	6/4"	No. 1 Common	
8,000'	8/4"	No. 1 Common & Better	
1 car	8/4"	No. 2 Common	

PLAIN RED OAK

1 car	3/4"	1s&2s	
2 cars	3/4"	No. 1 Common	
1 car	3/4"	No. 2 Common	
2 cars	4/4"	No. 1 Common	
2 cars	4/4"	No. 2 Common	

PLAIN WHITE OAK

1 car	4/4"	1s&2s	
4 cars	4/4"	No. 1 Common	
2 cars	4/4"	No. 2 Common	

MIXED OAK

3 cars	3/4"	No. 3 Common	
4 cars	4/4"	No. 3 Common	
2 cars	4/4"	Sound Wormy	
1 car	3/4"	Sound Wormy	

BLACK GUM

3,000'	3/4"	No. 1 Common & Better	Plain
2 cars	4/4"	No. 1 Common & Better	Plain
2 cars	8/4"	No. 1 Common & Better	Quartered

QUARTERED RED OAK

6,000'	8/4"	No. 2 Common & Better	

PLAIN SAP GUM

3 cars	5/8"	No. 1 Common & Better	
2 cars	5/8"	No. 2 Common	
2 car	4/4"	No. 2 Common	
2 cars	6/4"	& 8/4" Dog Boards	

QUARTERED RED GUM SAP NO DEFECT

3 cars	4/4"	No. 1 Common & Better	
3 cars	5/4"	No. 1 Common & Better	
5 cars	6/4"	No. 1 Common & Better	
5 cars	8/4"	No. 1 Common & Better	

PLAIN RED GUM

3 cars	4/4"	No. 1 Common & Better	

QUARTERED RED GUM

2 cars	4/4"	No. 1 Common & Better	
2 cars	6/4"	No. 1 Common & Better	
2 cars	8/4"	No. 1 Common & Better	

MISCELLANEOUS

2 cars	4/4"	No. 1 Shop Cypress	
1 car	6/4"	No. 2 Common Elm	
1 car	4/4"	Common & Better Cottonwood	
1 car	4/4"	Log Run Sycamore	

Wire or write for delivered prices. We can make immediate shipment on RUSH orders. Can load same day as we receive shipping instructions.

MEMPHIS BRUCE LITTLE ROCK

ARKANSAS HARDWOODS

The high standards in raw material and manufacturing equipment, which are responsible for the excellent nation-wide reputation of Bruce Oak Flooring, also prevail in the conduct of our hardwood operations.

BAND SAWN

RED and WHITE OAK

ASH · GUM

We can ship Oak Flooring, trim and moldings with hardwood lumber.

CORRESPONDENCE INVITED

THE E. L. BRUCE COMPANY

Manufacturers

LITTLE ROCK, ARKANSAS

BEDNA YOUNG Lumber Company

Jackson - Tennessee

Manufacturers of

Quartered White Oak
Quartered Red Oak
and Other Hardwoods

When in the market for

High Grade Lumber

please let us have your enquiries.

Sawed Veneer

Quartered White Oak
For Furniture and Panels

Plain Red Oak
For Interior Trim and Doors

Cypress
For Battery Separators

Manufacturing Uniformly Good.
Quality Unsurpassed

James E. Stark & Co., Inc.
MEMPHIS, TENN.

The Big Opportunity Is Here

A High Standard of Quality and Service

TO the manufacturer, the fact that present prices are lower than production costs, should be an incentive to stock up in Hardwoods before a sudden demand arises to snatch the opportunity away.

We need only point to the market reports to emphasize that prices will **not** be lower.

For the factory trade, we are enabled to ship at short notice any quantity of **Birch, Basswood,** or **Hard Maple.**

Anticipate the upward trend—get our quotations now.

Sawyer Goodman Company

Marinette - Wisconsin

Stimson Veneer and Lumber Co.

(Inc.)

Office and Mill: McLean Ave. and Union Belt R.R.

Memphis - Tenn.

We sell only the product of our own mills and make band sawn lumber in all Southern Hardwoods.

We specialize in Quartered White Oak, Red Oak, and Red Gum.

With allied companies we make fifty million feet annually.

J. V. Stimson Hardwood Co.

Manufacturers and Exporters

Band Mills: Memphis, Tenn., Helena, Ark.

Memphis - Tenn.

STOCK LIST

QUARTERED WHITE OAK
- 3 cars 4/4" 1s and 2s.
- 5 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common.

QUARTERED RED OAK
- 5 cars 4/4" 1s and 2s.
- 10 cars 4/4" No. 1 Common.
- 4 cars 4/4" No. 2 Common.
- 2 cars 6/4" No. 1 Common and Better.

QUARTERED RED GUM
- 10 cars 4/4" 1s and 2s.
- 3 cars 4/4" 1s and 2s Fig.
- 2 cars 5/4" 1s and 2s.
- 2 cars 6/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 2 cars 5/4" No. 1 Common.
- 2 cars 6/4" No. 1 Common.

QUARTERED RED GUM, Sap no Defect
- 5 cars 6/4" No. 1 Common and Better.
- 10 cars 8/4" No. 1 Common and Better.

ASH
- 4 cars 10/4" No. 1 Common and Better.
- 1 car 12/4" No. 1 Common and Better.
- 1 car 6/4" No. 1 Common and Better.
- 2 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common.

SAP GUM
- 10 cars 4/4" 1s and 2s.
- 20 cars 4/4" No. 1 Common.
- 10 cars 4/4" No. 2 Common.
- 2 cars 4/4" 18" up Panel.
- 5 cars 4/4" 13-17" Box Boards.

PLAIN RED OAK
- 2 cars 4/4" 1s and 2s.
- 2 cars 6/4" No. 1 Common and Better.
- 2 cars 10/4" No. 1 Common and Better.

PLAIN WHITE OAK
- 4 cars 4/4" No. 1 Common Plain.

COTTONWOOD
- 2 cars 4/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 5 cars 4/4" No. 2 Common.

ELM
- 2 cars 4/4" Log Run.
- 10 cars 10/4" Log Run.
- 10 cars 12/4" Log Run.

MAPLE
- 4 cars 12/4" Log Run.

Wire at our expense for delivered quotations that WILL SAVE YOU MONEY. All stock listed is band sawn and ready for prompt shipment.

QUARTERED WHITE OAK

15M	4/4	FAS	
60M	5/4	FAS	
30M	6/4	FAS	
200M	4/4	No. 1	Com.
100M	5/4	No. 1	Com.
250M	6/4	No. 1	Com.
70M	8/4	No. 1	Com.
25M	4/4	No. 2	Com.
15M	5/4	No. 2	Com.
20M	6/4	No. 2	Com.
7M	5/4	No. 3	Com.
7M	6/4	No. 3	Com.

QTD. WHITE OAK STRIPS

90M	4/4	C&B	1½-4½
10M	5/4	C&B	1½-4½
4M	6/4	C&B	1½-4½

PLAIN WHITE OAK

22M	4/4	FAS	
12M	6/4	FAS	
300M	4/4	No. 1	Com.
25M	5/4	No. 1	Com.
80M	6/4	No. 1	Com.

QUARTERED RED OAK

4M	4/4	FAS	
50M	5/4	FAS	
85M	4/4	No. 1	Com.
100M	5/4	No. 1	Com.
25M	6/4	No. 1	Com.

PLAIN RED OAK

35M	4/4	FAS	
20M	6/4	FAS	
200M	4/4	No. 1	Com.
200M	5/4	No. 1	Com.
125M	6/4	No. 1	Com.
15M	4/4	No. 2	Com.
20M	5/4	No. 2	Com.
20M	6/4	No. 2	Com.
175M	4/4	No. 3	Com.
40M	5/4	No. 3	Com.
50M	6/4	No. 3	Com.

QUARTERED SYCAMORE

20M	4/4	No. 2	C&B

SOUND WORMY OAK

200M	4/4	
80M	5/4	

QUARTERED RED GUM

50M	6/4		
1M	5/4	FAS	
6M	6/4	FAS	
40M	8/4	C&B	
30M	4/4	No. 1	Com.
9M	6/4	No. 1	Com.
150M	8/4	No. 1	Com.

PLAIN RED GUM

15M	4/4	FAS	
10M	4/4	C&B	
25M	5/4	No. 1	Com.
5M	6/4	No. 1	Com.
70M	4/4	No. 2	Com.

QUARTERED RED GUM (Sap No Defect)

200M	6/4	C&B	
300M	8/4	C&B	
300M	10/4	C&B	
300M	12/4	C&B	
9M	6/4	No. 2	Com.
4M	8/4	No. 2	Com.
5M	10/4	No. 2	Com.
4M	12/4	No. 2	Com.

PLAIN SAP GUM

15M	5/4	FAS	
3M	6/4	FAS	
185M	4/4	No. 1	Com.
100M	5/4	No. 1	Com.
70M	6/4	No. 1	Com.
30M	4/4	No. 2	Com.
100M	6/4	No. 2	Com.
7M	8/4	No. 2	Com.
25M	4/4	No. 3	Com.
5M	5/4	No. 3	Com.
100M	8/4	No. 3	Com.

ASH

125M	10/4	C&B	
40M	12/4	C&B	
2M	4/4	No. 1	Com.
70M	5/4	No. 1	Com.
35M	6/4	No. 1	Com.
2M	8/4	No. 1	Com.
15M	5/4	No. 2	Com.
4M	6/4	No. 2	Com.
15M	5/4	No. 3	Com.

COTTONWOOD

18M	4/4	wd bx bds	
8M	4/4	FAS	
200M	4/4	No. 1	Com.
30M	4/4	No. 2 & 3	Com.

CYPRESS

17M	4/4	Shop	
2M	6/4	Shop	
18M	6/4	No. 1	Com.
3M	6/4	No. 2	Com.
15M	4/4	No. 1	Com.

ELM

30M	4/4	No. 2	C&B
100M	8/4	No. 2	C&B
100M	10/4	No. 2	C&B
45M	12/4	No. 2	C&B
15M	16/4	No. 2	C&B
30M	10/4	No. 1	Com.

TUPELO GUM

15M		wd bx bds	
150M	4/4	C&B	
8M	5/4	C&B	
10M	6/4	C&B	
50M	4/4	No. 2	Com.

POPLAR

2M	4/4	saps & Sel.	
30M	4/4	No. 2 Com.	A&B

MAPLE

15M	4/4	No. 2	C&B
35M	10/4	No. 2	C&B

LOCUST

3M	4/4	No. 2	C&B

HACKBERRY

6M	4/4	No. 2	C&B

DIRECT FROM PRODUCER TO CONSUMER
WIRE YOUR INQUIRIES AT OUR EXPENSE

GAYOSO LUMBER COMPANY

MEMPHIS, TENNESSEE U.S.A.

Canadian Representative:

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Telephone, Parkdale 6751-W.

The Talge Mahogany Company

Indianapolis, Indiana

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MAPLE WALNUT OAK REDWOOD

MAHOGANY

PENCIL STRIPE MEDIUM STRIPE BROKEN STRIPE MOTTLE DRAWER BOTTOMS CEDAR FOR BOTTOMS

WALNUT VENEER

CURLY LEAFY STRIPE STUMPS BURL PLAIN

OAK VENEER

SAWED QUARTERED SLICED QUARTERED PLAIN SLICED DOOR STOCK

F. T .DOOLEY, President. T. E. JONES, Secy.-Treas.

F. T. Dooley Lumber Co.

Inc.

MANUFACTURERS and WHOLESALERS of

SOUTHERN HARDWOODS

Plain and Quartered Oak
Cypress, Gum, Ash
Soft Maple and Elm

Send us your inquiries

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Manufacturers and Wholesalers of

Hardwood and Yellow Pine Lumber

Office and Yard: 148 Carroll St. St. Louis, Mo.

Hardwood and Yellow Pine for Immediate Shipment from Stock

Complete Stock of Built Up Panels

3 and 5 Ply—Carried in Stock at St. Louis

FIR DRAWER BOTTOMS
FIR DOOR PANELS

Write us for our Stock and Price List

Aromatic Tennessee Red Cedar

CAR LOAD LOTS OR LESS

Earthman Lumber Co.
Murfreesboro, Tenn.

Quality plus Service

AT RIGHT PRICES

Let us quote you on concave chair seat, turned office, piano, restaurant and bath-room stool tops.

Solid table tops, cabinet work; in fact woodwork of all description.

Algoma Wood Products Co.
ALGOMA, WIS.

Band Sawn Poplar, Plain and Quartered White and Red Oak— Quartered Red Gum, Sap No Defect

Below we offer, subject to prior sale and immediate acceptance, the following stock:—

ASH

4/4"	Log Run	20,000 ft.
5/4"	Log Run	4,000 "
6/4"	Log Run	2,000 "
8/4"	Log Run	5,000 "

BASSWOOD

4/4"	No. 2 Com. & Btr.	35,000 "

BEECH

4/4"	Log Run	10,000 "
8/4"	Log Run	40,000 "
10/4"	Log Run	10,000 "
12/4"	Log Run	3,000 "

COTTONWOOD

4/4"	Log Run	10,000 "

QTRD. GUM, SND

4/4"	No. 2 Com. & Btr.	7,500 "
6/4"	FAS	20,000 "
6/4"	No. 1 Com.	40,000 "
8/4"	No. 1 Com.	30,000 "

PLAIN SAP GUM

4/4"	No. 1 Com.	45,000 "
4/4"	No. 2 Com.	30,000 "
5/4"	No. 1 Com. & Btr.	30,000 "

QTRD. BLACK GUM

4/4"	No. 2 Com. & Btr.	45,000 "

PLAIN BLACK GUM

4/4"	No. 1 Com. & Btr.	15,000 "

HICKORY

6/4"	Log Run	2,000 "
8/4"	Log Run	12,000 "

QTRD. WHITE OAK

4/4"	FAS	15,000 ft.
4/4"	No. 1 Com.	84,000 "
4/4"	No. 2 Com.	74,000 "
5/4"	Com. & Btr.	10,000 "

MAGNOLIA

4/4"	FAS	4,000 "
4/4"	No. 1 Com.	50,000 "
4/4"	No. 2 Com.	45,000 "

QTRD. WHITE OAK STRIPS

4/4"	Clr 2½ to 5"	13,000' "
4/4"	Com. 2 to 3"	3,500 "

PLAIN WHITE OAK

4/4"	No. 1 Com.	15,000 "
4/4"	No. 2 Com.	49,000 "

QTRD. RED OAK

4/4"	No. 1 Com.	60,000 "
4/4"	No. 2 Com.	12,000 "

PLAIN RED OAK

4/4"	FAS	48,000 "
4/4"	No. 1 Com	70,000 "
4/4"	No. 2 Com.	74,000 "
5/4"	FAS	30,000 "
5/4"	No. 1 Com.	20,000 "

PLAIN OAK

4/4"	Sound Wormy	78,000 "
4/4"	No. 3 Com.	83,000 "

POPLAR

4/4"	No. 1 Com.	200,000 "
4/4"	No. 2A & B Com.	220,000 "
6/4"	No. 1 Com. & Btr.	33,000 "

SYCAMORE

6/4"	Log Run	21,000 "

We own our stumpage and operate our own band mill in Bude, Miss., manufacturing ten million feet annually, on which we specialize in Quartered White Oak, manufactured from genuine forked leaf White Oak and Yellow Poplar of fine soft texture grown in the hills of Southern Mississippi.

Our grades are dependable and the manufacture of our stock is unsurpassed. We respectfully solicit your enquiries, which will receive our prompt and courteous attention.

L. D. Murrelle Lumber Company

General Sales Office: 1524 Exchange Bldg., Memphis, Tennessee

Band Mill: Bude, Miss.

Efficiency Marks Every Step of Our Service to You

Exact photograph of alley in our yard

White and Red Oak

Plain & Quarter Sawed Red Gum

Our Specialty Quarter Sawed Red Gum in Plain and Figured Wood

From the cutting to the delivery to your hands, our entire stock receives the most careful attention. All the excellence of quality and the beauty of the wood is kept just as it is when cut. When next you are in need of Oak, Ash, Elm, and Cypress of first class quality and in perfect condition write us. We can ship promptly.

BARR-HOLADAY LUMBER CO.

BAND MILL AT LOUISE, MISS. **GREENFIELD, OHIO**

SOUTHERN HARDWOODS

Dry Lumber in Buffalo for Quick Shipment

TENNESSEE SCENTED CEDAR

1 in.	92,700′	No. 1 Com. & Btr.
1¼ in.	5,000′	

CHERRY

	1&2	Clear Strips	No. 1 Com.	No. 2 Com.
1 in.	157,500	200	182,200	128,500
1¼ in.	3,500	......	21,600	2,500
1½ in.	10,000	......	37,700	26,300
2 in.	7,000	......	21,200	64,900
2½ in.	6,500	......	3,700	2,200
3 in.	28,700	......	3,500	3,300
4 in.	5,900	......	......	500

CHESTNUT

	1&2	Clear Strips	No. 1 Com.	S.W.& No. 2 Com.
¾ in.	1,000	......	51,000	103,000
1 in.	......	665	4,300	163,500
1¼ in.	171,800	300	89,200	199,200
1½ in.	51,500	......	52,000	......
2 in.	22,200	......	17,300	126,200
2½ in.	4,000	......	1,500	500
3 in.	2,100	......	1,300	500
4 in.	1,500	......	300	......

PLAIN RED GUM

		1&2	No. 1 Com.	No. 2 Com.
1 in.	......	25,300	13,000	15,500
1¼ in.	......	......	325	......
1½ in.	......	......	4,300	9,500
2 in.	......	......	......	7,500

QUARTERED RED GUM

	1&2	No. 1C	No. 2C
4/4	6,000	20,000	12,100
5/4	5,100	3,800	......
6/4	3,900	4,500	......
8/4	19,100	7,500	3,600

QUARTERED SAP GUM

	1&2	No. 1C	No. 2C
4/4	......	2,500	12,000
5/4	14,000	......	......
8/4	2,000	......	......
10/4	350	24,000	3,000

SAP GUM

		1&2	No. 1 Com.	No. 2 Com.
1 in.	......	3,400	6,000	200
1¼ in.	......	......	400	......
1½ in.	......	2,400	6,000	13,500
2 in.	......	......	5,700	10,400
2½ in.	......	......	......	......

PLAIN RED OAK

	1&2	Clear Strips	No. 1 Com.	No. 2 Com.
⅜ in.	24,200	......	......	......
¾ in.	104,000	......	124,000	33,200
⅝ in.	......	......	84,000	53,600
1 in.	95,200	3,550	133,000	142,400
1¼ in.	90,700	2,400	13,000	......
1½ in.	168,900	4,300	68,200	40,000
2 in.	148,100	......	180,800	71,000
2½ in	78,100	......	24,000	3,700
3 in.	28,800	......	20,500	7,000
4 in.	18,600	......	8,900	......

PLAIN WHITE OAK

⅝ in.	10,150	......	500	16,900
¾ in.	142,900	......	251,000	83,000
1 in.	16,300	1,700	129,000	85,200
1¼ in.	28,300	......	4,500	5,000
1½ in.	111,500	......	72,000	18,000
2 in.	94,000	......	131,000	65,000
2½ in.	176,800	......	56,500	3,000
3 in.	106,800	......	65,800	14,400
3½ in.	5,500	......	3,000	1,500
4 in.	77,000	......	22,500	6,000

QUARTERED RED OAK

	1&2	Clear Strips	No. 1 Com.	No. 2 Com.
¾ in.	1,700	......	9,700	400
1 in.	24,200	5,400	10,500	1,400
1¼ in.	3,000	......	3,000	500
1½ in.	......	......	......	......
2 in.	1,000	......	7,400	......

QUARTERED WHITE OAK

	1&2	Clear Strips	No. 1 Com.	No. 2 Com.
½ in.	6,500	......	......	......
¾ in.	550	300	23,600	9,000
⅝ in.	2,800	......	5,500	800
1 in.	57,400	18,000	61,400	27,000
1¼ in.	700	......	300	......
1½ in.	3,500	......	400	......
2 in.	......	......	25,100	5,700
2½ in.	1,000	......	......	......

POPLAR

	1&2	No. 1 Com.	No. 2 Com.	Bright Sap
⅝ in.	10,800	41,300	600	20,800
1 in.	42,000	208,900	127,000	23,200
1¼ in.	4,300	700	30,000	4,000
1½ in.	......	17,000	20,500	......
2 in.	6,600	5,500	24,500	1,800
2½ in.	4,800	......	......	......
3 in.	30,900	12,000	47,000	3,600
4 in.	......	......	450	......

BLACK WALNUT

		1&2	No. 1 Com.	No. 2 Com.
1 in.	......	1,200	......	14,400
1¼ in.	......	2,200	21,300	1,200
1½ in.	......	125	200	100
2 in.	......	100	4,500	1,900
2½ in.	......	......	145	45
3 in.	......	110	50	250
4 in.	......	......	500	1,200

Also Large Stocks of Ash, Basswood, Beech, Birch, Hard and Soft Maple.

THE ATLANTIC LUMBER CO., 310 Manning Chambers, Toronto

MANUFACTURERS SOUTHERN HARDWOOD LUMBER

Yards: BUFFALO, N.Y. Mills: KNOXVILLE, TENN.; FONDE, KENTUCKY

30 Million Feet Hardwoods Yearly

Manufactured by

Darnell-Love Lumber Co.

Leland, Mississippi

We own and operate two large band mills with sufficient timber to supply these mills, at present capacity, fifteen to twenty years

Cutting

Oak, Ash, Gum, Elm

Cypress, Cottonwood

and various other Native Woods

Our Specialties are—

3/8", 1/2", 5/8" and 3/4" in Gum and Oak

and

8/4" Quartered Red Gum

8/4" Quartered Red Gum Sap No Defect

WE SOLICIT YOUR INQUIRIES AND ORDERS

E. SONDHEIMER CO.

MEMPHIS, TENN., U.S.A.

Band Mills at
Baton Rouge, La., Sondheimer, La., Tallulah, La.
Office & Distributing Yard, Memphis, Tenn.

Manufacturers of Southern Hardwoods **Dry Stock Ready for Shipment**

Ask us for prices. We may be able to save you some money. We specialize in genuine Tensas Basin Red Gum—best in the world.

WHITE ASH
1 car each 1", 1¼", 1½" 1s&2s
2 " 2" 1s & 2s
7 " 1" No. 1 Com. & Sel.
3 " 1¼" No. 1 Com. & Sel.
1 " 1½" No. 1 Com. & Sel.
3 " 2" No. 1 Com. & Sel.
1 " each 2½" & 3" ditto
5 " 1" No. 2 Common
2 " 2" No. 2 Common
1 " 2½, 3½, 4" No. 2 Cm.

COTTONWOOD
5 " 1" 1s&2s
1 " 1½" 1s&2s
10 " 1" No. 1 Common
5 " 1¼" No. 1 Common
5 " 1½" No. 1 Common
3 " 1" No. 2 Common
4 " 1¼" No. 2 Common
10 " 1½" No. 2 Common
2 " 1x 9 to 12" Box Bds.
2 " 1x13 to 17" Box Bds.

CYPRESS
1 " 1" Shop
2 " 1" No. 1 Common
1 " each 1x 4, 1x 8", No. 1 Com.
1 " each 1x10, 1x12", No. 1 Com.
1 " 1" Pecky

SOFT ELM
2 " 1½" Log Run
5 " 2" Log Run

PLAIN SAP GUM
10 " each 1" & 1¼" 1s&2s
15 " 4/4" No. 1 Common
2 " 5/4" No. 1 Common
15 " 4/4" No. 2 Common
10 " 5/4" No. 2 Common
5 " 4/4" No. 3 Common

BLACK GUM
1 " 1" Log Run

PECAN
3 " 6/4" Log Run
4 " 8/4" Log Run

MAGNOLIA
2 " 1" No. 2 Common
1 " 1" No. 2 Common

QRTD. RED GUM
5 " 1" 1s&2s
3 " 1¼" 1s&2s
2 " 2" 1s&2s
1 " each 2½ & 3" 1s&2s
8 " 1" No. 1 Common
3 " each 1¼ & 2" No. 1 C.

QRTD. RED GUM
(Sap No Defect)
10 " 1" 1s&2s
1 " 1½" 1s&2s
3 " 2" 1s&2s
5 " 1" No. 1 Common
3 " each 1¼ & 2 "No. 1 C.

QRTD. WHITE OAK
3 " 1" No. 1 Common
1 " 1" No. 2 Common

QRTD. RED OAK
3 " 1" 1s&2s
5 " 1" No. 1 Common
2 " 1" No. 2 Common

PLAIN WHITE OAK
1 " 3/4" 1s&2s
1 " 3/4" No. 1 Common
6 " 4/4" No. 1 Common
5 " 4/4" No. 2 Common

PLAIN RED OAK
2 " each 1" & 1¼" 1s&2s
15 " 1" No. 1 Com. & Sel.
1 " 1¼" No. 1 Com. & Sel.
10 " 1" No. 2 Common
1 " 1¼" No. 2 Common
5 " 1" Sound Wormy
8 " 1" No. 3 Common

QRTD. TUPELO
1" 1s&2s

PLAIN-SAWN TUPELO
6 " 1" 1s&2s
10 " 1" No. 1 Common
5 " 1" No. 2 Common
1 " 1" No. 3 Common
1 " 1x13 to 17" Box Bds.

WILLOW
8 " 1" 1s&2s
5 " 1¼"1s&2s
1 " each 1½ & 2" 1s&2s
15 " 1" No. 1 Common
8 " 1¼" No. 1 Common
1 " 1½" No. 1 Common
10 " 1" No. 2 Common
8 " 1¼" No. 2 Common
10 " 1½" No. 2 Common
5 " 2" No. 2 Common
1 " 1x13 to 17" Box Bds.

Lumber
Walnut, Mahogany Plain and Quartered Oak, Ash, Cherry

Veneers
Walnut and Mahogany

WE specialize in AMERICAN BLACK WALNUT and can furnish straight cars from 3/8 to 4 inches in thickness. Also can load mixed cars WALNUT and MAHOGANY LUMBER and VENEERS, PLAIN and QUARTERED RED and WHITE OAK, ASH and CHERRY.

The Kosse, Shoe and Schleyer Co.

Eastern Branch:
BALTIMORE, Md.

Main Office and Band Mill:
CINCINNATI, Ohio

American Walnut Lumber

QUALITY

SERVICE

More evidence of our untiring efforts to procure the very best raw material for our product.

All Grades and Thicknesses

Pickrel Walnut Company

St. Louis, Missouri

Tustin Hardwood Lumber Co.

MEMPHIS TENN.

KILN DRIED AND AIR DRIED SOUTHERN HARDWOODS

We operate five mills and Memphis yard, specializing in KILN DRIED Sap Gum, Elm, Maple, Ash. *Send us your inquiries.*

Will quote low prices on following to points not embargoed

4 cars 4/4 No. 1 C. & B. Qtd. White Oak.
1 " 4/4 Fas Qtd. Red Oak.
1 " 4/4 No. 1 Com. Qtd. Red Oak.
2 " 4/4 Fas Plain Red Oak.
5 cars 4/4 No. 1 Com. Plain Red Oak.
3 " 8/4 No. 1 C. & B. Qtd. Red Gum.
4 " 8/4 No. 1 C. & B. Qtd. Sap Gum.

Johnson Brothers Hardwood Co.

(OUR NAME IS EASY TO REMEMBER)

Bank of Commerce & Trust Building **MEMPHIS TENN., U.S.A**

Manufacturers and Wholesalers

SOUTHERN HARDWOODS

3,000,000 ft. dry stock on hand and 5,000,000 in process of drying—all thicknesses, ½" to 4", plain and quartered.
White and Red Oak—Red Gum—Sap Gum—Tupelo—Black Gum — Cottonwood—Salix—Willow—Pecan—Sycamore—Elm—Soft Maple—Magnolia.

We offer for quick Sale at bargain prices the following Bone Dry Stock:

1 c/l 4/4" No. 1 & 2 Common Qtd. White Oak
2 c/l 8/4" No. 1 Common Qtd. Red Gum, S.N.D.
2 c/l 10/4 Log Run Sycamore
1 c/l 10/4 Log Run Soft Maple
5 cars 4/4" FAS Cottonwood, Regular Widths
1 c/l 8/4" No. 1 C & B Red Gum
1 c/l 8/4" No. 1 C Sap Gum
1 c/l 6/4" No. 1 C & B Red Gum
2 cars 10/4" Log Run Ash

Wire us at our expense for quotations

What will conditions be a few months hence?

The re-adjustment which started in the early Fall of 1920 cut the supply of Hardwood lumber for the year at least 50 per cent.

Weather conditions have since caused a further reduction.

General prospects for business are good

The wise man will protect himself against the Hardwood shortage which is in sight.

May we protect you with some of our stock against this condition?

Your enquiries will have our careful attention and your interest will be our first consideration.

The Pedwell Hardwood Lumber Co.

FT. SPADINA AVE. TORONTO, ONT.

Anderson, Shreiner & Mawson

WHOLESALE LUMBER

Phone Main 1604 ——————————43 Victoria Street, Toronto

Birch, Maple, Elm, Ash, and Basswood

Write or "Phone" for Prices. Mills at SOUTH RIVER, Ont.

OAK ASH COTTONWOOD MAPLE

Chapman & Dewey Lumber Company

Manufacturers of

Southern Hardwoods

Band Sawn at our Mills in the St. FRANCIS RIVER BASIN

We solicit your enquiries

—

Offices:

MARKED TREE, Ark. KANSAS CITY, Mo.

GUM ELM SYCAMORE CYPRESS

BOLAND LUMBER CO.

Murray Bldg., Grand Rapids, Mich.

Manufacturers and Wholesalers Northern and Southern Hardwoods

Northern Woods:	Southern Woods:
Ash, Basswood, Beech,	Cherry, Chestnut,
Birch, Hard Maple,	Cottonwood, Cypress, Gum,
Quartered Maple,	Hickory, Magnolia,
White Maple, Soft Maple,	Oak, Poplar, Sycamore,
Soft Elm, Rock Elm,	Walnut, Willow.

Yards at Grand Rapids, Mich., on Grand Trunk and Michigan Central R.R.

Please send us your enquiries and it will be a pleasure to quote you and describe our stocks.

OAK

Plain and Quartered

Uniform Color—Soft Texture

Poplar, Ash

and other

Hardwoods

We have 35,000,000 feet dry stock—all of our own manufacture, from our own timber grown in Eastern Kentucky

Prompt Shipments

The Mowbray & Robinson Co.

(INCORPORATED)

Manufacturers

Office: CINCINNATI, OHIO

MILLS

Quicksand, Ky.; Viper, Ky.; West Irvine, Ky.

Canadian Representative:

M. E. CUMMINGS, 814 Richmond Ave., Buffalo, N. Y.

West Virginia Oak

Thoroughly Dry, Accurately Sawn, Soft Textured, and Uniform in Color.

Write us when needing choice stocks. All lumber produced from virgin timber of large size and excellent quality.

Twenty Million Feet Hardwood Ready for Immediate Shipment

OAK

Yellow Poplar, Ash, Hickory, Beech, Chestnut, Basswood, Walnut, Maple

THE THOMAS HALL LUMBER COMPANY

Manufacturers

CHARLESTON, WEST VIRGINIA

M. BROWN, Canadian Repres. **Address: 87 Neville Park Blvd., Balmy Beach, Toronto**

Tallahatchie Lumber Company

MEMPHIS, TENN.

Manufacturers of

Band Sawn Hardwoods

Graded so as to be especially attractive to Furniture Manufacturers.

Careful attention to every detail of service.

SEND US YOUR INQUIRIES

High Grade White Hickory

Ready for immediate shipment "Buttcut" Brand Second Growth White Hickory, absolutely sound and clear of defects.

20,000 feet 1-1/2" x 2" x 36"
20,000 " 1-5/8" x 2-1/8" x 36"
20,000 " 2" x 2" x 40"
10.000 " 1" x 2" x 36" & 40"
10,000 " 1" x 1-3/4" x 36" & 40"
10,000 " 1" x 1-5/8" x 36"
10,000 " 1" x 1-1/2" x 36"

60,000 feet assorted
1-1/2" x 2" x 12" & 24"
1-5/8" x 2-1/8" x 12" & 24"
1-1/2" x 2-1/4" x 12" & 24"
1-5/8" x 2-1/4" x 12" & "24
1-3/4" x 2-1/4" x 12" & 24"
1-3/4" x 2-3/8" x 12" & 24"
1-3/4" x 2-3/4" x 12" & 24"
2" x 2-3/8" x 12" & 24"
2" x 2-1/2" x 12" & 24"

20,000 feet assorted
1-1/8" x 1-1/4" x 6' to 7' 6"
1-1/4" x 1-1/4" x 6' to 7' 6"
1-1/4" x 1-3/8" x 6' to 7' 6"
1-3/8" x 1-3/8" x 6' to 7' 6"

25,000 feet assorted Squares
2", 2-1/8", 2-1/4", 2-3/8", 2-1/2", 2-5/8"
all 6'0" to 8'0" long

BROWN BROTHERS COMPANY

11 Broadway, New York City. **Cable Address: "Lignis" New York**

Southern Michigan Beech

The lower peninsula variety excells any other locality in the soft, even texture and straight grained quality of this product. Cut from old growth virgin timber, this stock is representative of the highest standard of quality.

5/8 No. 2 Com. & Btr. 170M
4/4 Selected & Better 125M
4/4 No. 1 Common 100M
4/4 No. 2 Common.. .. .. .. 80M
5/4 No. 1 Com. & Btr. 175M
5/4 Selects & No. 1 Com. 25M
5/4 No. 2 Com. & Btr. 200M
5/4 No. 2 Common 50M
6/4 No. 1 Com. & Btr. 150M
6/4 Selects & No. 1 Com. .. 30M
6/4 No. 1 & 2 Common 52M
6/4 No. 2 Com. & Btr. 250M
6/4 No. 2 Common 75M
8/4 No. 2 Com. & Btr. 150M

Our complete assortment offers exceptional opportunities for replenishing your stocks. If the items listed do not offer the assortment desired, we will supply any grade or combination of grades.

We can kiln dry.

20 Million Feet of Assorted High Grade

NORTHERN HARDWOODS

THE BIGELOW-COOPER CO.

BAY CITY - - MICHIGAN

Thompson-Katz Lumber Co.

Manufacturers of

WHITE ASH EXCLUSIVELY

In dealing with us the wood worker and furniture manufacturer may rightly expect a better service, better value and a greater selection from which to choose his requirements. We have all grades and all thicknesses to offer—beautiful stock that we know will please you. Drop us a card to-day—we'll do the rest.

MEMPHIS, TENNESSEE

The London Lumber Co. Ltd.

WHOLESALE LUMBER

We have to offer several cars of good Birch, Elm, and Soft Maple in all thicknesses; Write us for quotations.

487½ Richmond St., London, Ont.

Hardwoods

We can furnish you immediately Factory Stock including all grades and thicknesses of

Walnut, Chestnut
Mahogany, Teak, Oak
Ash, Cypress

ALSO

VENEERS

Oak, Maple, Walnut and other Fancy Woods

The McLennan Lumber Co.

Limited

MONTREAL

J. H. Bonner & Sons

Memphis, Tenn.

Mills:
Jonquil and Ruffwood, Ark.

Manufacturers

Band Sawn Hardwood Lumber

Write or wire for prices on

Gum, Oak, Elm, Etc.

Crating Lumber

We specialize in the following Crating lumbers
Spruce, White Pine, Jack Pine, Norway Pine, Balm, Poplar, Birch, Maple, Basswood and Elm.

W. Y. Lloyd

350 Confederation Life Building
TORONTO, CANADA
PHONE MAIN 5532

Chas. Gill Lumber Co.

WAUSAU, WISCONSIN

MANUFACTURERS & WHOLESALERS

SPECIALIZING IN

MAPLE
BIRCH
AND
BASSWOOD

Complete Stock Crating Material

We solicit correspondence relative to all Northern Hardwoods

Chicago Office — 501 Lumber Exchange

Band Sawn West Virginia HARDWOODS

The W. C. Barlett Lumber Co.

Charleston, W. Va.

Manufacturers

ASH to WALNUT

We produce a complete line of Band Sawn Hardwoods, serving the Body and Wheel, Furniture, Piano, Cabinet and Interior Finish Trades.

If Superior Quality, Fine Width and Length, coupled with Real Service is desired, let us have your enquiries.

Hardwood Dowels

Plain, Straight and Spiral Grooved

"Canada Wood" dowels are manufactured from high-grade Maple, Birch, Beech or White Oak, uniform in length and nicely pointed, quality guaranteed.

We also manufacture Bailwoods and Variety Turnings in all styles, sizes and descriptions, in the plain, or Enamelled in Black, Natural Wood or Mahogany finishes. Three-eighth in. Maple, Birch and Quarter Cut White Oak Flooring a Specialty. Broom and Mop Handles of every description.

Canada Wood Specialty Co. Limited

ORILLIA ONTARIO

Sawmills at Zebra and Orillia, Ont.
Cable Address: "Special," Orillia, Can.

D. E. Hewit Lumber Co.

Huntington, W. Va.

MANUFACTURERS

West Virginia Hardwoods

(Not Better than the Best but as Good as the Best)

FAS Plain White and Red Oak
No. 1 Com. Plain White and Red Oak
Implement Oak
Sound Wormy Chestnut
No. 1 Common and Better Chestnut
Hickory Plank
Poplar and Basswood

Burns & Knapp Lumber Co.

Manufacturers of

Southern Hardwoods

Plain White and Red Oak, Dimension Oak, Hickory, Ash, Chestnut, Poplar, Basswood, Walnut, Maple, Beech, Butternut.

CONNEAUTVILLE,——————PA.

We list below, items of our own manufacture, band sawn, that we are in a position to ship promptly.

1/2", 5/8, 3/4, 4/4, 5/4, 6/4 & 8/4 Quartered White Oak

3/4, 4/4, 5/4 & 6/4 Qtd. Red Oak

5/8, 3/4, 4/4, 5/4, 6/4 & 8/4 Plain Oak

4/4, 5/4, 6/4, & 8/4 Sound Wormy Oak

5/8, 4/4, 5/4 & 6/4 Plain Sap Gum

4, 5, 6, 8, 10 & 12/4 Qtd. Sap Gum

4, 5 & 6/4 Plain Red Gum.

4, 5, 6, 8, 10 & 12/4 Qtd. Red Gum

4, 5, 6 & 8/4 Tupelo Gum.

5/8, 4, 5, 10 & 12/4 Ash.

5/8, 4, 5, 6, 8, 10 & 12/4 Elm.

5/8, 10 & 12/4 Maple.

4, 5 & 6/4 Cottonwood.

MAY BROTHERS

Office and Band Mills:
MEMPHIS, TENNESSEE

St. Francis Basin Hardwoods
Tennessee Aromatic Red Cedar

SAP GUM

15,000′	4/4″	FAS
100,000′	4/4″	No. 1 Common & Selects.
100,000′	4/4″	No. 2 Common
100,000′	4/4″	No. 3 Common
100,000′	5/4″	FAS
100,000′	5/4″	No. 1 Common & Selects
100,000′	5/4″	No. 2 Common
50,000′	5/4″	No. 3 Common
25,000′	6/4″	FAS
25,000′	6/4″	No. 1 Common & Selects
100,000′	6/4″	No. 2 Common
100,000′	6/4″	No. 3 Common

QUARTERED RED GUM
(Sap no defect)

75,000′	5/4″	No. 1 Common & Better
75,000′	6/4″	No. 1 Common & Better

PLAIN RED GUM

50,000′	4/4″	FAS
100,000′	4/4″	No. 1 Common & Selects
100,000′	4/4″	No. 2 Common
100,000′	5/4″	No. 1 Common & Selects
100,000′	5/4″	No. 2 Common
50,000′	6/4″	No. 1 Common & Selects
50,000′	6/4″	No. 2 Common

QUARTERED RED GUM

50,000′	4/4″	No. 1 Common & Selects
25,000′	5/4″	FAS
50,000′	5/4″	No. 1 Common & Selects
100,000′	6/4″	No. 1 Common & Selects
30,000′	8/4″	No. 1 Common & Better

BLACK GUM

13,000′	4/4″	Log Run, Plain
50,000′	4/4″	Log Run, Quartered

50,000′	5/4	Log Run Elm
30,000′	10/4	Log Run Maple
50,000′	4/4	1s&2s Plain White Oak
50,000′	4/4	No. 1 Common & Selects Plain White Oak
30,000′	4/4	Common & Better Plain Red Oak
50,000′	4/4	No. 1 Common & Selects Red Oak

GEO. C. BROWN & COMPANY

General Office, - MEMPHIS, TENN.

BAND MILLS, PROCTOR, ARK. LAKE VILLAGE, ARK.

The Wise Buyer ——

QUALITY SERVICE

The best time to buy, is—now. Prices are down. The next movement will be upward.

We are specialists in our field of activity, which means a high standard of Quality and service.

Manufacturers of

OAK - POPLAR - GUM

Memphis Band Mill Co.

"Quarter-Sawn White Oak Headquarters"

Memphis, Tenn. - U. S. A.

DRY STOCK READY FOR SHIPMENT

Your inquiries will bring very prompt quotations. You can depend on straight grades, quick service, and well manufactured lumber.

RED GUM

11219′	8/4	FAS Qtd.
36728′	8/4	No. 1 Com. & Sel. Qtd.
700′	6/4	No. 1 Com. & Sel. Qtd.
4500′	5/4	1st & 2ds Qtd.
19260′	5/4	No. 1 Com. & Sel. Qtd.
3820′	4/4	No. 1 Com. & Sel. Qtd.
62834′	6/4	1st & 2nds
501944′	6/4	No. 1 Com. & Sel.
90395′	6/4	No. 2 Common
2527′	5/4	1st and 2ds Figured
49525′	5/4	1sts & 2nds
350130′	5/4	No. 1 Com. & Sel.
4400′	5/4	No. 1 Com. & Btr. FAS No. 1 Com. & Sel.
29180′	5/4	No. 2 Common
12186′	4/4	1sts & 2nds
103750′	4/4	No. 1 Com. & Sel.
3070′	4/4	No. 1 Com. & Btr. Figured
141775′	4/4	No. 2 Common
37986′	3/4	1sts & 2nds
38280′	3/4	No. 1 Com. & Sel.
26695′	3/4	No. 2 Com. & Sel.

SAP GUM

22000′	8/4	No. 1 Com. & Btr. Qtd. FAS No. 1 Com. & Sel.
6700′	8/4	No. 2 Common Qtd.
3600′	8/4	1sts & 2ds Plain
5680′	8/4	No. 1 Com. & Sel.
14120′	8/4	No. 2 Common
323670′	6/4	1sts & 2ds
677410′	6/4	No. 1 Com. & Sel.
38490′	6/4	No. 2 Common
8500′	6/4	No. 3 Common
168571′	5/4	1sts & 2nds
26745′	5/4	No. 1 Com. & Sel.
190865′	5/4	No. 2 Common
52400′	5/4	No. 3 Common
12502′		1x18" & up Panel & No. 1
11472′		1x11" & wider 1sts & 2ds
12790′		1x13-17" Box Boards
53645′	4/4	9-12" Box Boards
25490′	4/4	1sts & 2ds
294394′	4/4	No. 1 Com. & Sel.
84312′	4/4	No. 2 Common
69590′	4/4	No. 3 Common
48163′	3/4	1sts & 2ds
38530′	3/4	No. 1 Common
8669′	3/4	No. 2 Common
14142′		6 to 8/4 Dog Boards

ELM

87367′	10/4	Log Run No. 2 Com. & Btr.
59221′	8/4	No. 2 Com. & Btr.
27882′	5/4	Log Run
15360′		1" to 3" No. 2 Com. & Btr.

PECAN—DRY

4500′	8/4	Log Run
4500′	8/4	Flitches
12000′	6/4	No. 2 Com. & Btr.

OAK

6700′	4/4	1sts & 2ds Qtd. Red
30413′	4/4	No. 1 Com. & Sel. Qtd. Red
6814′	4/4	No. 2 Com. Qtd. Red
25-9′	4/4	No. 3 Com. Qtd. Red
4196′	4/4	No. 2 Com. Qtd. White
9986′	4/4	No. 3 Com. Qtd. White
3450′	10/4	No. 1 Com. & Btr. Red FAS No. 1 Com. & Sel.
4500′	10/4	Common Red
8190′	4/4	1sts & 2ds Plain Red
191673′	4/4	No. 1 Com. & Sel Red
97500′	4/4	No. 2 Common Red
73179′	4/4	No. 1 Com. & Sel. White
22099′	4/4	1sts & 2ds Mixed
156530′	4/4	No. 2 Common Mixed
80237′	4/4	No. 3 Common Mixed
125921′	4/4	Sound Wormy

LA. CYPRESS

8200′	10/4	Shop & Btr. FAS Sel. Shop
3100′	8/4	1sts & 2ds
94601	8/4	Selects
3960′	8/4	Shop
2350′	8/4	Shop & Better
5830′	8/4	No. 1 Common
1800′	6/4	1sts & 2ds
18515′	6/4	Select
3420′	6/4	Shop
7500′	6/4	Pecky
3000′	5/4	No. 1 Common
8000′	5/4	No. 2 Common
3500′	5/4	No. 2 Pecky
3500′	4/4	No. 1 Shop
4872′	4/4	No. 1 Common
12496′	4/4	No. 2 Common
98710′	4/4	Pecky
13425′	4/4	No. 2 Boxing

LA. WHITE ASH

33990′	10/4	No. 1 Com. & Btr. FAS No. 1 Com. & Sel.
22200′	8/4	No. 2 Common
5100′	6/4	1sts & 2ds
16011′	6/4	No. 1 Com. & Sel.
14835′	6/4	No. 2 Common
16646′	6/4	No. 1 Com. & Btr.
28370′	5/4	No. 1 Com. & Sel.
4800′	4/4	No. 1 Com. & Btr. FAS No. 1 Com. & Sel.
10050′	4/4	No. 2 Common
43546′	4/4	No. 3 Common

ARKANSAS YELLOW PINE

196292′	4/4	No. 1, 2 & 3 Com. 6-8-10-12" Widths

COTTONWOOD

19970′		Log Run 30% No. 1 Com. & Sel. 20% No. 2 Com.

ABERDEEN LUMBER COMPANY, Pittsburgh, Pa.

The Arrow Lumber Co.

Manufacturers and Wholesalers of
West Virginia
Hardwoods and White Pine

Oak Timbers Our Specialy

PARKERSBURG, W. VA.
Mills: Raleigh, W. Va. Natural Well, Va.

McLEAN MAHOGANY & CEDAR CO., INC.

American Hardwoods

WE SOLICIT YOUR ENQUIRIES

742 Ellicott Square, Buffalo, N.Y.

Yellow Poplar Lumber Co.

Manufacturers of Band Sawed

Poplar Plain Oak
Quartered Oak
Chestnut Basswood

Capacity 50,000,000 per annum

SPECIALTY: Monogram Brand Oak Flooring

CANADIAN ENQUIRIES SOLICITED

COAL GROVE, OHIO, U. S. A.

The Bacon Lumber Co.

HARDWOODS:

OHIO and INDIANA
KENTUCKY and WEST VIRGINIA
NORTHERN BIRCH and MAPLE
SOUTHERN GUM, COTTONWOOD

306 Ulmer Bldg., Cleveland, Ohio

FIBRO PRODUCTS
REEDS ∴ RATTANS
TURPENTINE
RESIN ∴ WASTE
∴ LINTERS ∴

∴ *PROMPT OR FUTURE SHIPMENTS* ∴

E. T. CARTER & CO., LIMITED
84 FRONT ST., E. —— TORONTO

For Discriminating Buyers

Dry stock ready for prompt shipment

FIGURED RED GUM

3	cars	4/4″	No. 1 Com. & Btr.

SAP GUM

2	"	4/4″	FAS
2	"	4/4″	FAS, 13″ & up
3	"	4/4″	Box Boards, 13-17″
1	"	5/4″	FAS
1	"	8/4″	Com. & Btr.
3	"	4/4″	No. 1 Common
4	"	5/4″	No. 1 Common
8	"	4/4″	No. 2 Common
10	"	5/4″	No. 2 Common
1	"	6/4″	No. 2 Common
1	"	8/4″	No. 2 Common

PLAIN RED GUM

1	"	4/4″	FAS
3	"	5/4″	FAS
6	"	4/4″	No. 1 Com. & Btr.
3	"	4/4″	No. 1 Common
5	"	5/4″	No. 1 Common
1	"	8/4″	No. 1 Common
3	"	4/4″	No. 2 Common

QUARTERED RED GUM

3	"	4/4″	Com. & Btr.
2	"	5/4″	FAS
5	"	4/4″	Com. & Btr.
4	"	6/4″	Com & Btr.
3	"	8/4″	Com. & Btr.
3	"	5/4″	No. 1 Common

SOFT ELM

1	"	4/4″	Log Run
1	"	5/4″	Log Run
2	"	6/4″	Log Run
1	"	8/4″	Log Run
2	"	10/4″	Log Run
2	"	12/4″	Log Run

QUARTERED RED GUM S.N.D.

1	"	5/4″	FAS
1	"	3/4″	Com. & Btr.
3	"	4/4″	Com. & Btr.
10	"	6/4″	Com. & Btr.
7	"	8/4″	Com. & Btr.
2	"	5/4″	No. 1 Common

WILLOW

5	"	4/4″	Log Run

CYPRESS

1	"	4/4″	No. 1 Shop
2	"	4/4″	No. 1 Common
1	"	5/4″	FAS
1	"	5/4″	Select
1	"	5/4″	No. 1 Shop
1	"	8/4″	FAS
1	"	8/4″	Select
1	"	8/4″	No. 1 Shop
1	"	8/4″	No. 1 Common

PLAIN RED OAK

1	"	4/4″	FAS
6	"	4/4″	No. 1 Common
7	"	4/4″	No. 2 & No. 3 Common

QUARTERED RED OAK

1	"	4/4″	FAS
7	"	4/4″	No. 1 Common
6	"	4/4″	No. 2 Common

PLAIN WHITE OAK

1	"	4/4″	FAS
4	"	4/4″	No. 1 Common
2	"	4/4″	No. 2 Common

QUARTERED WHITE OAK

1	"	4/4″	FAS
5	"	4/4″	No. 1 Common
7	"	4/4″	No. 2 Common

WIRE FOR QUOTATIONS AT OUR EXPENSE

The

Frank A. Conkling Company

SOUTHERN HARDWOODS

BAND MILLS:
PERCY, Miss., ISSAQUENA, Miss.

Memphis, Tenn.

WHEELER - TIMLIN LUMBER CO.

WAUSAU, Wisconsin.

You cannot beat the Birch for an all round wood for the furniture manufacturer. We have BEAUTIFUL BIRCH in all standard thicknesses from 4/4″ to 10/4″ and all grades. Write us for delivered prices.

Mills at DORCHESTER, Wis., and WITTENBERG, Wis.

Upham & Walsh Inc.

Throop St. South of 22nd St.

Chicago

Northern and Southern Hardwoods

We make a Specialty of

Oak, Gum, Elm, Maple Birch and Basswood.

We solicit your inquiries regarding lumber of any kind

The Hyde Lumber Co.

Band Mills: LAKE PROVIDENCE LA.

Southern Office: MEMPHIS, TENN.
Bank of Commerce Bldg.

Northern Office: SOUTH BEND, IND.

MANUFACTURERS

Plain Red Gum
Quartered Red Gum
Plain Sap Gum
Quartered Sap Gum
Cottonwood, Cypress
Tupelo, Ash, Elm, Oak

CHARLES O. MAUS
Canadian Representative

American Hardwood Lumber Co.

St. Louis, Mo.

Large stock of—

Dry Ash, Quartered Oak Plain Oak and Gum

Shipments from — NASHVILLE, Tenn., NEW ORLEANS, La., and BENTON, Ark.

WARREN ROSS LUMBER CO.

JAMESTOWN, N. Y.

30,000′	4/4″	1s&2s Tanguile Mahogany	12,000′	8/4″	No. 1 Com. Walnut
35,000′	6/4″	to 16/4 1s&2s Tanguile Mahogany	7,000′	8/4″	No. 2 Com. Walnut
20,000′	4/4″	1s&2s Cherry	15,000′	4/4″	1s&2s pl Red Oak
12,000′	4/4″	No. 1 Com. Cherry	4,000′	5/4″	1s&2s Pl. Red Oak
5,000′	6/4″	1s&2s Cherry	4,000′	6/4″	1s&2s Pl. Red Oak
5,000′	8/4″	1s&2s Cherry	20,000′	8/4″	1s&2s Pl. Red Oak
5,000′	5/4″	No. 1 Com. Cherry	20,000′	4/4″	No. 1 C P Red Oak
2,000′	8/4″	No. 1 Com. Cherry	4,000′	5/4″	No. 1 C P Red Oak
110,000′	1″ to 2″	No. 2 Com. & Btr. Beech	4,000′	6/4″	No. 1 C P Red Oak
1,500′	5/4″	Selects Walnut	10,000′	8/4″	No. 1 C P Red Oak
15,000′	8/4″	1s&2s Walnut	15,000′	4″4″	1s&2s Poplar SND
			3,000′	5/4″	1s&2s Poplar SND
			3,000′	8/4″	1s&2s Poplar SND

Above stock in our Jamestown yard where we have a large stock of all kinds of dry Hardwoods. Also Northern and Southern Hardwoods and Mahogany direct from mill in unlimited quantities.

MAHOGANY LUMBER *and* VENEER
AMERICAN WALNUT VENEER

Loading Mahogany Logs in the Tropics

OUR LARGE AND SELECTED STOCK AT YOUR INSTANT DISPOSAL WHEN NEEDED

Lewis Thompson & Co., Inc. - Colonial Trust Building, Philadelphia, Penn.

Warerooms: Astoria L.I., High Point, N.C. Yards: Astoria, L.I., New Orleans, La.

Established 1843

E. R. Spotswood & Son

INCORPORATED

MANUFACTURERS OF

Kentucky Hardwood Lumber

We specialize in soft texture Kentucky Oak—Plain and Quarter Sawed, also in Ash, Basswood, Chestnut, Poplar, Beech.

Let us quote you on your requirements—our prices are right and we can make prompt shipments direct from our mills.

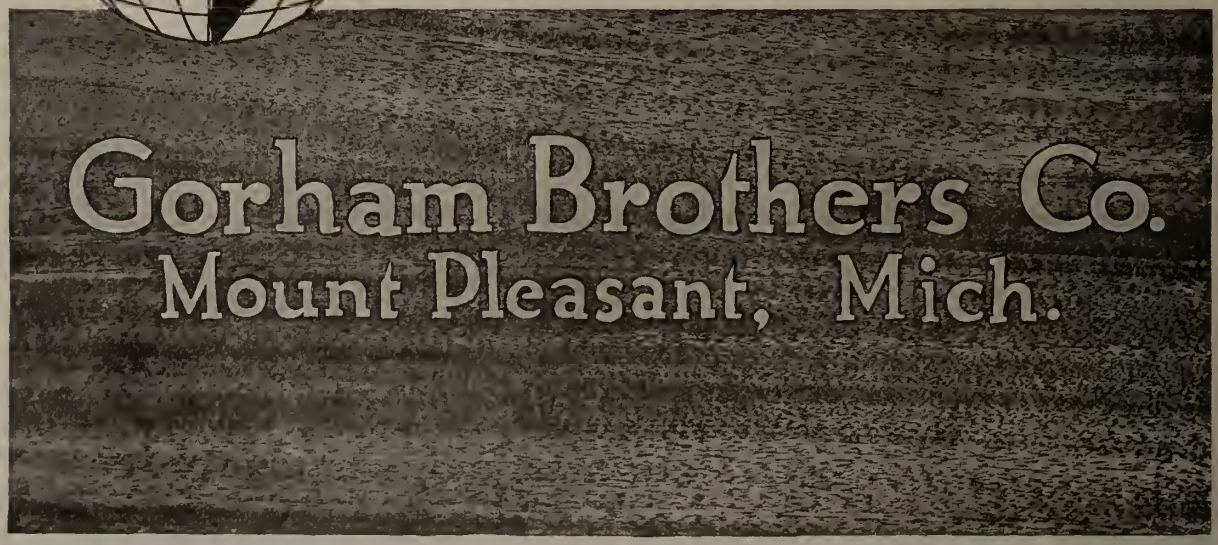
LEXINGTON - - KENTUCKY

"Gorham Quality"

built up stock

THE pride of attainment follows each piece of stock which leaves our hands, because we know that Gorham Quality serves the furniture manufacturers in an exceptional manner. Our built-up stock is the result of three generations' constant, diligent study of the problem of producing highest quality panels, desk beds and tops that will not warp, check, blister or loosen.

Gorham products will not fail you.



"Hartzell's Choice Walnut"

The way Walnut comes to us

COMING AND GOING

One constant stream of American Black Walnut from "Stump to Consumer" flowing through a steady, reliable and satisfactory channel.

"Geo. W. Hartzell"

Logs in the rough coming in Veneers and Lumber of the highest quality going out daily year in and year out covering a period of 35 years.

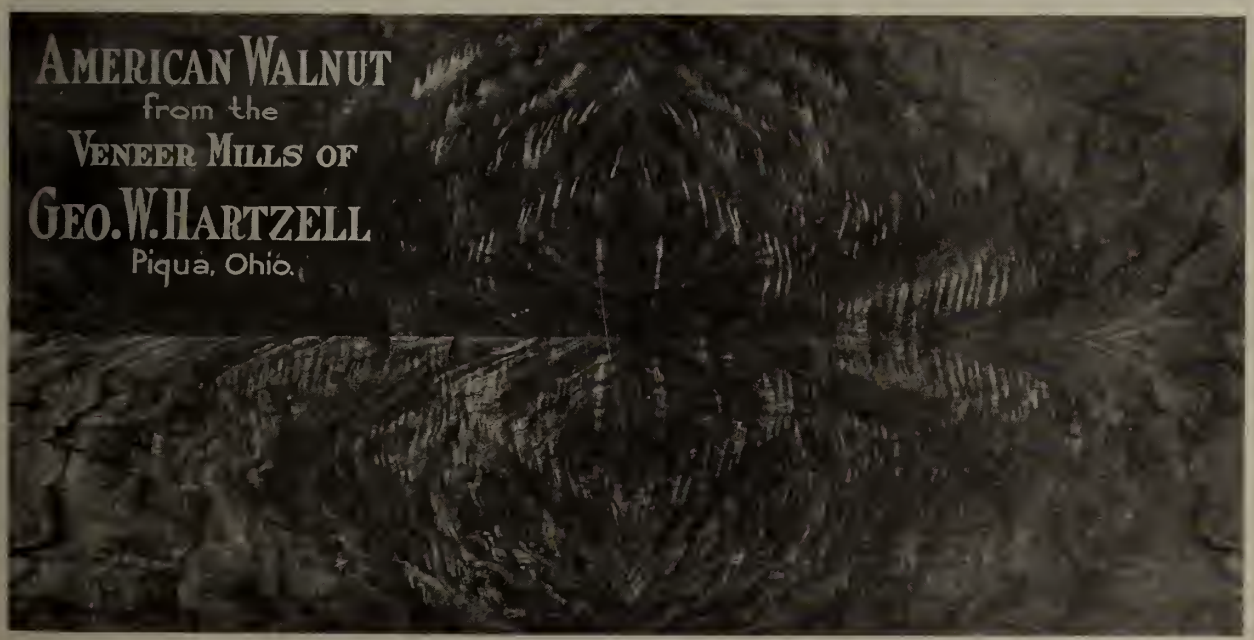
We rightfully claim your patronage because of "SERVICE and QUALITY," if there is any question in your mind about it

"Try Us and We Will Ship You the Convincer"

No Order too large, no Order too small to receive the close and careful attention it is our custom to give. That is a great part of our business, serving our customers.

"WRITE FOR SAMPLES AND QUOTATIONS"

Geo. W. Hartzell - Piqua, Ohio



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50,000' 1" Log Run
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5 " 1 No. 2 Common
3 " 1¼ No. 1 Common
7 " 1¼ No. 2 Common
10 " 2 No. 1 Com&1s&2s
7 " 2 No. 2 Common
3 " 2½ No. 1 Com&1s&2s
3 " 2½ No. 2 Common
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BOXING & CRATING
3 cars 1" Basswood, Elm & Ash
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Soft Yellow Poplar
Plain White Oak
Plain Red Oak
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Hickory	Walnut
Beech	Sycamore
Buckeye	Black Gum
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12,000	"	4/4 x 6 in. and up Qt'd White Oak Fas.
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2,680	"	3/4 x 13/17 Sap Gum Fas.
4,700	"	3/4 x 3/12 Sap Gum No. 1 Com.
400	"	5/4 x 6 in. Plain red Gum Fas.
4,000	"	4/4 x 6 in. up Sap Gum No. 1 Com.
5,000	"	8/4 x 6 in. up Qt'd red Gum C. & B.
8,000	"	5/4 x 6 in. Plain White Oak Fas. ... ...
2,000	"	6/4 x 4 in. Plain White Oak No. 1 Com.
15,000	"	6/4 x 6 in. Plain red Oak Fas.
10,000	"	8/4 x 6 in. Plain red Oak Fas.
25,000	"	8/4 x 4 in. Plain red Oak No. 1 Com..
12,000	"	4/4 x 3 in. Tenn. Red Cedar No. 1 C. & B.
25,000	"	8/4 Sound Wormy Chestnut
2,000	"	5/4 Sount Wormy Chestnut
32,000	"	6/4 Sound Wormy Chestnut
5,000	"	4/4 Chestnut No. 1 C. & B.
10,000	"	5/4 Chestnut No. 1 C. & B.
10,000	"	6/4 Chestnut No. 1 C. & B.
43,000	"	4/4 Soft Elm No. 3 C. & B.
1,000	"	4/4 Soft Elm No. 3 Common
12,000	"	8/4 Soft Elm No. 2 C. & B.
15,000	"	12/4 Soft Elm No. 2 C. & B.
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12,000'	3/4 No. 2 Com. & Btr. Plain Oak.
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60,000'	4/4 No. 2 Com. Plain Oak.
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29,000'	5/4 No. 2 Com. Plain Oak.
16,000'	8/4 No. 1 Com. & Btr. Plain Oak.
160,000'	4, 6, 8, 10 and 12/4 No. 2 Com. & Btr. Soft Elm and Soft Maple.
90,000'	4 and 8/4 No. 2 A&B Com. Poplar.
75,000'	8, 10 and 12/4 No. 1 Com. & Btr. Poplar.
75,000'	4/4 No. 2 Com. & Btr. Basswood.
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150,000'	4, 5, 6 and 8/4 No. 2 Com. & Btr. Beech.
200,000'	4, 5, 6 and 8/4 Sound Wormy Chestnut.

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South Bend, Indiana

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Bureau Drawers That Slide

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The supreme beauty of Walnut, in addition to the above qualities (and plus its "workability" and its "carvability"), accounts for the world-old supremacy of Walnut as a cabinet-wood—and its price permits its use in *every grade* of furniture that the careful buyer is likely to ever consider.

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Walnut Lumber Co.

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All grades and thicknesses
Guaranteed Inspection

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Kansas City - Kansas

SPECIALS!

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QUARTERED RED GUM

8 cars 2½" Common and Better.
5 " 3" Common and Better.
8 " 1¼" Common
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6 cars 2½" Common & Better.
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10 cars 1" No. 1 Com. and Btr., White, Pln.
10 " 1" No. 1 Com. and Btr., Red, Qtd.
2 " 1½" 1sts & 2ds Qtd. White.

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WHITE OAK	BASSWOOD
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JOHNSON CITY, TENNESSEE

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Oak	Basswood
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Ash	Birch

Rotary-Cut Soft Yellow Poplar Veneers
Quarter-Sawn White Oak Flitches
Sliced and Sawn Quartered White Oak Veneers
Oak and Maple Flooring
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5-16" Oak Parquetry Flooring Strips and Squares carried in stock at our warehouses:
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Quartered Red and White

OAK

1,000,000 feet of dry stock carried at all times

ALSO PLAIN OAK AND ASH

We manufacture all stock carried

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FRANK M. CUTSINGER, Pres.
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Mills at EVANSVILLE, Indiana

E. M. Nicholson & Co.

Wholesalers of Canadian Hardwoods

201-2-3 Board of Trade Bldg.,

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BROWN ASH

60,000′	4/4	No. 1 C&B
16,000′	6/4	No. 1 C&B
8,900′	8/4	No. 1 C&B

BASSWOOD

75,000′	4/4	Sel. & Fas.
100,000′	4/4	No. 1 & 2. Com.
75,000′	6/4	No. 1 Com. & FAS
50,000′	6/4	No. 2 Com.
40,000′	8/4	No. 1 C&B

MAPLE

75,000′	4/4	Log Run

BEECH

65,000′	4/4	Log Run

BIRCH

30,000′	4/4	FAS
90,000′	4/4	No. 1 Com.
150,000′	4/4	No. 2 Com.
30,000′	5/4	No. 1 Com. & FAS
45,000′	6/4	FAS
60,000′	6/4	No. 1 Com.
75,000′	6/4	No. 2 Com.
100,000′	8/4	Sel. & Fas.
150,000′	8/4	No. 1 Com.
100,000′	8/4	No. 2 Com.
75,000′	10/4	Sel. & Fas.
125,000′	10/4	No. 1 Com.
250,000′	12/4	Sel. & Fas.
100,000′	16/4	Sel. & Fas.

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45,000′	4/4	No. 2 C&B
21,000′	6/4	No. 1 C&B
22,000′	8/4	No. 1 C&B

150,000′ 4/4 Basswood, Birch, Ash, Elm No. 3 Com. Under National Rules.

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There is considerable discussion and anticipation of the return of hardwood to pre-war prices. This cannot be. With freight rates 100% higher than in 1914—labor advanced 100%, and provision made for a fair margin of profit to be earned on plants erected at high costs, it is impossible to bring costs down to pre-war levels.

Present indications point to an advance in prices. Existing stocks are 60% below normal and the cut this year is estimated as being 40% below normal. Improved business conditions must lead to enlarged demand with consequent high prices.

It would be to your interests to anticipate your requirements and order now.

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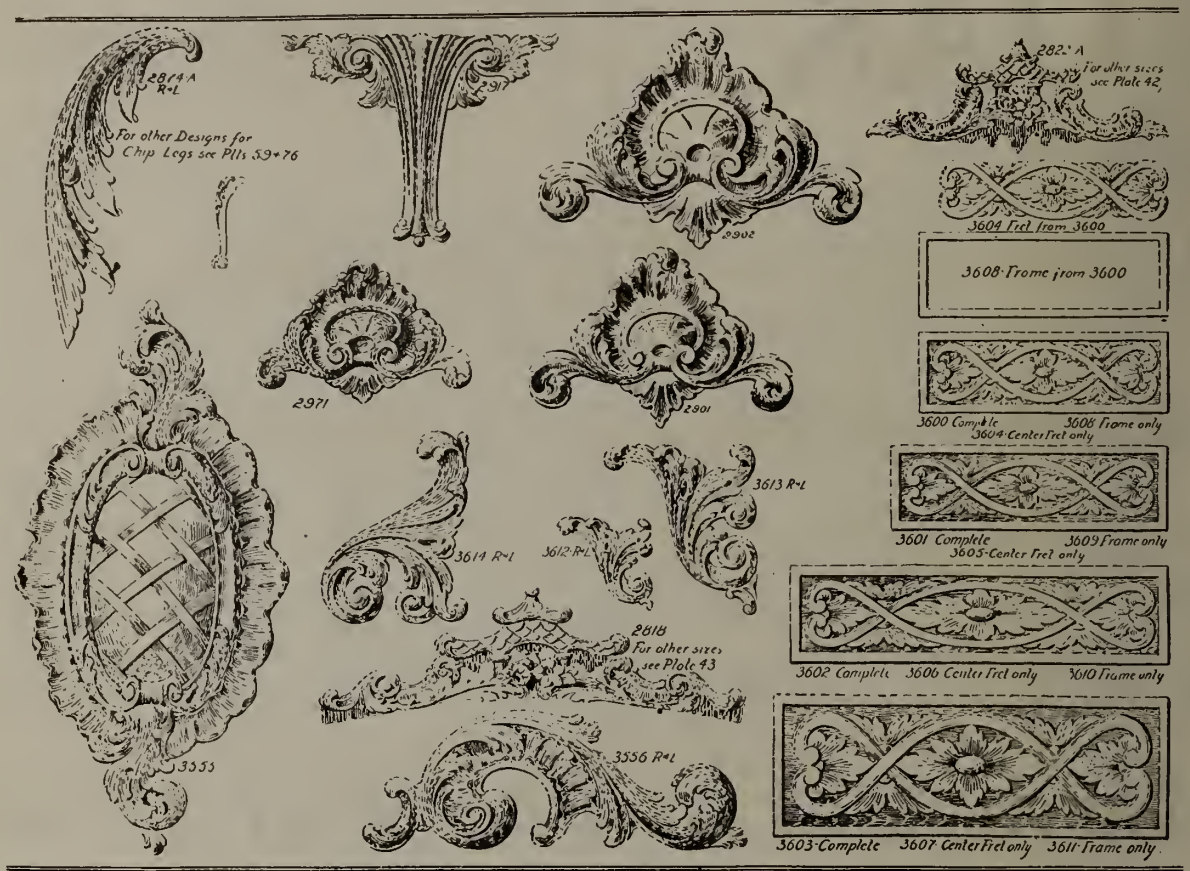

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TO

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(Plant Equipped with Latest Machinery)

Drawer Side Material and Moulder Work.

Dimension Lumber Kiln Dried Means:

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2. **A saving of at least 40% in freight.**
3. **Lumber delivered at the woodworker's plant ready for immediate use.**
4. **A quick turnover and minimum investment in lumber.**

The benefits to be derived from the use of Chicago Mill Dimension Lumber are cumulative. In the long run it means lower production cost for the finished article.

For particulars and prices address

Chicago Mill and Lumber Company

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Ash, Elm
Oak, Gum
Cottonwood
Cypress, Maple

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Automobiles
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(HAVE YOU SECURED OUR QUOTATIONS ON ROTARY CUT VENEER?)

SOUTHERN HARDWOODS

Unexcelled Quality and Service

Prompt Shipment — Dry Stock — Uniform Quality and Inspection
Band Sawn and End Trimmed — Full and Uniform Thickness — Good Run of Widths and Lengths

Twenty-five years of service to the most exacting users of quality hardwoods enables Paepcke Leicht to help you get your exact requirements in southern hardwoods no matter what they may be.

This experienced service is impartial,—its purpose is to help you select the wood best suited for your use—uniform in quality and of the most economical grade which will prove entirely satisfactory for the job.

We Specialize in Oak and Gum

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Mahogany
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Poplar
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And all U. S. A. Hardwoods
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Basswood
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And all other Canadian Hardwoods

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Qtd. White Oak
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Birch, Poplar, Ash, Gum
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Mahogany, Walnut
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We Specialize in Mixed Shipments of Dry Hardwoods, Veneers and Panels

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Head Office and Veneer Warehouse
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WOODWORKER
and
Furniture Manufacturer

A Monthly Publication of Trade News and Practical Information, reaching the factories producing Interior Finish, Doors, Sash, Flooring, Boxes, Aeroplanes, Furniture, Pianos, etc.

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Branches:
Montreal, Winnipeg, Vancouver, New York, Chicago.
Subscription, $2.00 a year; foreign, $2.50.

Authorized by the Postmaster General for Canada, for transmission as second class matter.

Vol. 21 Toronto, February, 1921 No. 2

SUBSCRIPTION RATES

The postal rates on periodicals having been trebled on January 1st, 1921, the subscription price of the "Canadian Woodworker" has been increased to $2.00 a year; United States and Foreign, $2.50. Current subscriptions will be continued at the former rate until expiration of the subscription year.

Costs Must be Reduced

Whether business revives next month, next summer or next fall, one fact stands out clear and that is that prices must be lowered and costs reduced.

Perhaps, it would be better to put it the other way around and state that costs must be lowered so that prices may be reduced. It would be folly to suggest that prices be cut unless production costs warrant such a move. At times, whether through force of circumstances or otherwise, a manufacturer may find it advisable to sell his product, for a limited period, at a price below replacement value. In doing so he is impairing his capital and diminishing the recuperative power of his business. Such tactics, if persisted in, can lead to but one result—one which is not pleasant to contemplate. As lower values must prevail, and that means lower manufacturing costs, one may well ask how can costs be reduced?

It is easy to suggest a number of ways in which costs might be lowered but the difficulty is to carry out such sugestions in actual practice. Such items as increasing production, curtailing overhead, reducing wages, increased efficiency of plant and employees, cheaper raw material, elimination of waste and stricter attention to buying, so that none but the most suitable materials be secured, would have a favorable effect on the cost of any product.

A closer analysis of some of these factors shows that all are not applicable under present conditions. Increased output and slackened demand do not go well together; neither do curtailed production and a decreased percentage of overhead. There are many expenditures which may be reduced, or eliminated altogether, but as the output is restricted, the general tendency is for the percentage of burden to climb.

The question of a general reduction in wages has been discussed in recent issues of the "Canadian Woodworker and Furniture Manufacturer." Wages have been lowered in some plants, in others the number of working hours have been increased, but the general attitude of the whole industry seems to be to maintain the present scales, if at all possible. This does not mean that the majority of woodworkers do not believe that ultimately lower rates will prevail but rather that any attempt at the present time to reduce costs should not be made at the expense of the workmen. Some interesting views on this subject will be found elsewhere in this issue.

When business is quiet is a good time to look into the efficiency of the factory. There is more time available and one has the advantage of being able to take a more deliberate view of the plant and its operations. It may be that the rearranging of a few machines will eliminate lost motion, reduce handling costs and result in an even flow of work from machine to machine. Again perhaps it might be advisable to lay a set of rails to the cut-off saw, rip-saw or planer so that the loaded kiln trucks may be spotted convenient to the machine operators. Tracks might also be placed in the lumber yard so that one handling would suffice to move the stock from railway car to machine room.

The productiveness of the employees is something which each individual mechanic must work out for himself. He must bear his share. If he does not think a cut in wages is justifiable, he must be made to realize that increased efficiency is the only other alternative. That the men can increase production was instanced in a certain woodworking plant where a ten per cent. reduction in staff resulted in a twenty per cent. increase in production. When another ten per cent. was laid off, production jumped another fifteen per cent.

Waste is something with which all woodworkers have to contend. It occurs in varying degrees in every plant. In the box industry they estimate that from seventeen to twenty per cent. is a fair allowance while some woodworkers figure on from thirty to forty-five per cent. The amount of waste depends on the product, the grades of lumber used, the attitude of the management and employees and the provision made for utilizing the small cuttings. Before a determined effort is likely to be made to eradicate this waste, the enormity of the loss must be realized. This can only be ascertained by close and careful checking. If one knew that forty per cent. of all stock entering the plant was lost, it is likely that drastic steps would be taken.

An analysis of manufacturing costs and a close examination of the different factors which affect the cost of production might open up the way to savings that would enable one to meet present market conditions without impairing profits or reducing wages.

Shall Wages be Reduced or Maintained?

Many Woodworkers Express Views on This Vital Question—Industry Not Unanimous—Interesting Views and Opinions From Different Centres

The article on the wage question, published in the January "Canadian Woodworker," seems to have struck a responsive chord. Prominent woodworkers in different parts of the Dominion have written outlining their views and policies. The majority of the communications received contain the intimation that the rates prevailing in different woodworking centres are none too high and should be maintained for the present at least. The belief is prevalent, however, that wages must ultimately drop to a lower level, but that present conditions do not warrant a reduction at this moment.

On the other hand, certain woodworkers have made reductions running from 5 to 20 per cent., while others have increased the number of hours from 9 to 10 without increasing the rate per day. Where the scale being paid was above the average, there is some justification for putting a lower rate into effect. The demand for lower values must be met. This can be done, to a certain extent at least, if the workmen and artisans in the various woodworking plants will settle down and work and thus increase their productiveness. Many interesting views and sidelights are to be found in the letters received.

Attitude of B. C. Manufacturers

Average rate paid. "Wages in all branches of the woodworking industry in British Columbia must come down. We are endeavoring to market our wood products at a time when the demand has fallen off and values have declined. To secure even a fair volume of business it is necessary to cut prices away down, below the cost of production in some cases. In this paring down it is only just and right that labor bear a share.

"Again we are faced with competition from American woodworking plants in which wages have been lowered. We must follow suit to be able to compete.

"The following figures will give an idea of the wages being paid in the different industries. While these may not apply to every individual plant they can be taken as a kind of basic range for the whole industry":

Box Factories

Boys, under 18 years..	.25	Planer feeder	42½
Common labor, inside.	.40	Resaw, single band	42½
Cut-off saw	42½	Resaw, twin band	45½
Cutter	42½	Ripper	42½
Outside labor, common.	42½	Tiers, boys and women.	.35

Planing Mill

Engineer	47½	Machine setter	47½
Feeders	.45	Moulding man	47½
Filer	.50	Moulding tier	42½
Foreman	Optional	Off bearers	42½
Graders behind machine	47½	Piler	42½
Resaw feeder	.45	Rip saw feeder	.45
Knife grinder	.45	Transfer man	42½

Lumber Yard

Common labor	42½	Pilers of trucks	42½
Fortman	Optional	Stackers	42½
Grader shop	.50	Switchmen	.45
Green lumber pilers (day labor)	42½	Track men and tramway men	42½
Pile bottom men	42½	Teamster, 1 horse	42½
Motormen and chauffeurs	47½	Teamster, 2 horse	45½

* * *

Lower wages in B. C., according to one manufacturer. "Wages are higher in woodworking plants in British Columbia than in the state of Washington, our near-by competitors. Therefore a reduction in wages must come. Manufacturers should, however, assure themselves that such reductions are as near as possible, in the same ratio as the drop in the cost of living.

"There must be good will and co-operation between labor and capital to bring satisfactory results. All industries in the same line, in each locality, should get together and establish a scale of wages entirely fair to labor. Lower wages will compel lower prices and lower prices will create demand and volume, and factories will take on new life; labor will be fully employed and all will be well.

"We are looking forward to 1921 to be a good year. It will surprise the pessimists."

Opinion Divided in N. B.

A St. John woodworker intimates that he is of the opinion that lower wages will certainly obtain from this time forward. "The manufacturing plants in this section have already had to reduce wages, effective as at January 1st, ranging from ten to twenty per cent. and in consequence they have been able to revise downwards the selling prices of their products. The downward march in wages will be more or less slow, but it is sure to come and with it of course must come the cost of living. Our artisan class must also be made to realize how desirable it is to cut out some of the useless and needless expenditures which have been going on during the period of high wages and the sooner conditions return back to something like normal the better it will be for both the employers and employees."

* * *

Another New Brunswick manufacturer contends that wages are now too high. "We have not made any reduction in wages and do not think it is advisable to do so, for the reason that the wages paid in the woodworking factories here are lower, we believe, than in many of the other trades. No doubt a general reduction in prices would tend to revive business, but we are hoping that with spring that the usual revival will take place."

Lower Scale in Nova Scotia

Very difficult to get universal rate, says Nova Scotian woodworker. "We have reduced our workmen 10 per cent. starting February 1st. We found it necessary to do this. All woodworking factories in the Maritime provinces are reducing wages from 10 to 20 per cent.

"I am afraid we will see very little improvement in demand for building supplies until prices are reduced. When the public sees there is a reduction being made, even if it is very slight, it will be encouraged to buy. A reduction will have to be made in all raw material, before we can get prices reduced to any considerable amount, as labor is the largest item in any line of manufactured goods.

"It is practically impossible to get a universal wage rate in the woodworking business throughout Canada. It is very hard to get an equal rate in one province. There are so many small factories being started from time to time and the price of finished products is re-

duced by them. The larger factories have to reduce their prices to meet this competition, even if they produce a better line of goods. We have always been in competition with small concerns, starting and running perhaps for a year or two and then going out of business, and I presume we always will be. This is one of the disadvantages of the woodworking business."

"May say the rates of wages we have been paying are:

37c per hour for laborers.
40c per hour for machine helpers.
45c to 60c per hour for machine men.
55c to 60c per hour for bench men.

Attitude of Furniture Industry

Ontario furniture manufacturer thinks wages should not be forced down. "The principle of attempting to force wages down is entirely wrong. Banks or the people, who are in positions to do so, are endeavoring to reduce wage scales, and thus bring things back to a normal condition, but the start should be made at the other end. Living expenses throughout the country should be standardized. Thus, each district or zone could be allotted a proportionate wage per individual for living, clothing and educational expenses. Thus, in the broadest sense of the word, we would be giving the population of Canada a chance to educate citizens who would be citizens of the highest order.

"As it is now, with the reduced wage, and the price of living still high, it is just a question of shifting the burden. These people have to live. They will go to the retailer and get credit, which will cause bad debts, which will never be collected, so, unless the retailer is simply an iron man, and absolutely refuses to give further credit, he will have to stand the biggest part of the load. If there was such a thing as establishing a standard rate of wage throughout the country, and see that every man, who is willing to work, receives that living wage, plus extra for special ability, and the man who is not willing to work, but is able to work, railroaded out of the community.

"By this, I mean that we should take the emblem of the country, the beaver, as our pattern. There are no drones allowed in the beaver colony. Of course, it is true they appoint their watchmen, who do not appear to do manual labor, and their duty is to watch. Therefore, in our present state of society, we have to have so many who do not perform manual labor, but, nevertheless, they are producers of the highest order, and are entitled to their place in society, and to receive value for their endeavors.

Must Hold Skilled Hands

"It is very hard to say just what the prevailing rate is in the furniture field. From my own experience, for a mechanic, responsible for his own work, and the work of two or three improvers, the rate is around 55s to 65c an hour. Unless we manage to keep the wages of the woodworker high enough that he can enjoy some of the comforts and educate his family equal to the fimilies of men in a similar position in other industries, we are going to lose some of the sons of the present day woodworkers, who would naturally follow in this line. They will go into other trades where they can make more money.

"Referring to the wages again. I believe some of the mechanics, who are responsible for their own work only, are receiving about 45c an hour to 55c an hour. Of course, there are so many different departments in the furniture industry, that what applies to the machine hand, who takes a large hazard with his fingers, does not apply to the cabinet-maker or to the finisher. These wages are correspondingly less."

Attitude N. S. Furniture Manufacturer

Pays same scale as other furniture men. "We note your remarks, in the January "Canadian Woodworker," regarding the present outlook in wages, and it is certainly a very difficult question to handle, as there are so many sides to it. We have been paying the same scale of wages as other manufacturers in the furniture business in Upper Canada and are not aware whether our competitors have made any reductions or not. We are of the opinion that in the majority of cases no changes have been made as yet. We do not see that wages can be or should be reduced until there is a substantial drop in the cost of living, and while there have been some slight reductions in the price of various commodities, as yet they are not large. It is possible that we will make a cut of not more than 5 per cent. in our wages at a little later date. The future to our minds depends altogether on the cost of living.

"Under present conditions there is practically nothing doing in the furniture business. It is not a question of price. Furniture cannot be sold at any price, as the dealers are simply not buying. We cannot think that this will last for any great length of time, and as retail stocks are not large, there is almost bound to be a good demand for our product within a few weeks. There is no doubt that on a falling market such as we are now experiencing, the manufacturer who pays a lower wage has the advantage, that is if he can keep his employees satisfied and get the results. However, we hope that there will not be such competition in the future as there was in the past. It was certainly hard for everyone concerned, and we think that all have seen the folly of it and will endeavor to keep the woodworking business on a stable basis."

Increases Number of Hours

"We believe that if prices and production are to reach pre-war conditions the production also must level up and other conditions must be reinstated. Our own policy for the next few months will be to resume operations on a ten hour day plan, paying the same rate for ten hours as previously paid for nine hours' work.

"There is no attempt being made, so far as we know in the Kitchener district to reduce wages and manufacturers would be very loath to have wages again so low as to detract from the industry."

Present Scale to Hold in Quebec

Depends on workmen themselves. "Our policy is not to reduce wages. We do not think that present conditions warrant such a move and we want to be fair with our employees. What we would like to see is for every workingman to buckle down and do a good day's work. If the efficiency of labor was to be restored to its former basis, it would result in lower production costs. Thus the demand for a lower level of prices could be met without touching wages. This is a problem which is largely up to labor itself. If they will not do their fair share a reduction in wages may be found to be absolutely necessary."

Will not make any change for present. "We are running a sash and door factory and employ about fifteen to twenty men. We have a good set of men and pay them a fair wage and for the present do not feel like like making any reduction. Rents are going

(Continued on page 128)

Jas. E. Ferguson, Cost Accounting Department, Woodstock, Ont., chairman, Labor Committee.

J. H. Baetz, Baetz Bros. Furniture Co., Limited, Kitchener, Ont., chairman Furniture Manufacturers' Ass'n. for 1921.

Mark Rowe, Canada Furniture Manufacturers Limited, Woodstock, Ont., chairman, Credit Men's Committee.

Furniture Men in Annual Conference

All Departments of Association Doing Splendid Work—Interesting Address on Prevention of Accidents—Officers For Ensuing Year

The annual meeting of the Furniture Manufacturers' Association, which was held in Toronto, February 1st and 2nd, was marked by a very satisfactory attendance, about 45 furniture manufacturers being represented. A number of interesting addresses were presented and questions of vital interest to the industry discussed. In addition, the various officials and committees were elected for the ensuing year.

F. M. Tobin, secretary of the Industrial Accident Association, gave a short address on accidents in furniture plants. Mr. Tobin touched on the various classes of accidents which occur in factories of this kind. In presenting statistics, he showed that what is known as "Class 3" under the Workmen's Compensation Act, embraces 175 furniture factories, etc., employing 15,319 hands. The number of accidents reported for this class was 655. These might be divided up as follows: Accidents caused by circular saws 117, jointers 40, shapers 28, planers 25, falling objects 64 and infection 60. He urged upon the manufacturers present the advisability of making a strong endeavor to reduce accidents and so safeguard their machines that the number of mishaps will be materially reduced during 1921.

Gratifying Support Given

This was followed by a short address by Mr. Lovett, safety inspector. Mr. Lovett enlarged on some of the remarks made by Mr. Tobin and pointed out that mechanical guards will only prevent 25 per cent. of the accidents. The other 75 must be eliminated by care on the part of the workmen. He also touched upon the necessity of insisting that every workman receive first aid, no matter how slight the injury.

As the work of the association for 1920 was covered pretty thoroughly by the address of the retiring chairman, W. J. Anderson (published elsewhere), the secretary, Wm. Cawkell, did not touch on the general features of the work for the past year. He drew attention to the fact that 57 registered meetings were held during 1920 and spoke of the gratifying attendance which was recorded at these meetings; forty-six of the members attended 5 meetings or over, a number having been present on over 25 occasions. This is most gratifying, for the success of the association depends upon the efforts of its members, and the growth and standing of the Furniture Manufacturers' Association reflects credit on each individual member. The secretary then read the financial statement which was passed.

Work of Cost Department

James E. Ferguson of the Cost Accounting Department, gave an outline of the market conditions which prevailed during 1920. The peak of commodity prices was reached early in the spring, and since then there has been a gradual decline. The prices of furniture were advanced during the year, in accordance with the increase in costs, the necessary adjustments being made from time to time. New price lists were issued recently based on present values. Touching on costs, Mr. Ferguson stated "One of the matters, which will require much attention, is the variation of costs. Compilation of records is not the chief aim in cost-accounting. The main purpose is to bring to notice excessive costs of any kind so that immediate steps can be taken to correct them. Efforts will be made to gather information regarding cost details of materials and operations, and through the study of these facts to establish standards. By this means we hope to secure greater uniformity, having in view the greatest reduc-

tion consistent with service and quality. It is believed that an intensive study of costs will lead to considerable improvement. Owing to present uncertain conditions it must be pointed out once more that there is danger in piling up stocks of manufactured goods."

The report of the Credit Committee, which was presented by James Garvie, in the absence of Mark Rowe, the chairman of the committee, reviewed the activities of this section for the past year. In closing, Mr. Rowe intimated that it can be said without fear of contradiction that no similar trade organization in Canada has anything like such an efficient credit service as is now being given to the members of this association.

Election of Officials and Committees

The officials and committees elected for the ensuing year are as follows:—

Chairman—J. H. Baetz.

Vice-chairman—Wm. Krug.

Secretary—Wm. Cawkell.

Executive Committee—W. J. Anderson, H. Ford, G. W. Gibbard, G. A. Gruetzner, W. G. Hay, J. S. Knechtel, D. E. Macintyre, L. Malcolm, J. R. Shaw, H. M. Snyder, D. M. Wright.

Labor Committee—J. E. Ferguson (chairman), G. A. Gruetzner, P. R. Hilborn, J. S. Knechtel, Wm. Krug, D. E. Macintyre, Jas. Malcolm, H. M. Snyder, D. M. Wright, A. H. Watson, W. A. Oliver, A. H. Smyth.

Credit Men's Committee—Mark Rowe (chairman), M. S. Armstrong, W. J. Fleischaeur, Jas. Garvie, R. Gomery, R. Purtle, C. G. McLellan, H. B. Shortt, L. J. Salter.

Chairmen of sections who are also members of the Advisory Board—Better Case Goods, Jas. Malcolm; Medium Case Goods, C. M. Bell; Lower Case Goods, J. E. Campbell; Office Furniture, P. R. Hilborn; Tables, W. G. Durst; Chairs, W. O. Winterholt; Upholstery, Geo. Hughes; Office Filing Devices, W. E. Dolan.

Address of Newly Elected Chairman

In taking the chair, the newly-elected chairman, J. H. Baetz, addressed the members present as follows:

"I assure you that I appreciate the honor you have conferred upon me in making me chairman of your association. I realize also that you have given me a real man's job for 1921. I am following Mr. Anderson, who has been a very good chairman, and other good men who were before him, and I have the ideals that they have set up in carrying out the work of the association, to assist me.

"I can only appeal to your loyalty to the association and to the realization of what the association has meant to you in the last five years, for continued support during 1921. Had the association not existed during the last six or eight months we all know what would have happened, and know what will happen if the association does not carry on during the next six or eight months, each one loyal to the other.

"I think the work of the association in 1921 will require that the different sections and committees meet very frequently, for the details can be worked out before presentation to the association, and in a smaller body of men, differences can be ironed out more than in a larger meeting.

"I hope also that the association's members will loyally support the Home Furnishings Bureau, which is being re-organized, and I feel that it is going to be one of the best things the association ever organized. The furniture industry in the United States is going to spend two million dollars in advertising, and if this association had done nothing more than to start something like this, the sentiment created would be worth the work done."

It was moved and seconded: "That it is the opinion of the furniture manufacturers that a turnover tax should be substituted for Dominion Profits Tax and the Sales Tax now imposed by the Dominion Government."

Wm. Cawkell, Toronto, Secretary of the Association.

It was also moved and seconded: "That a special committee be appointed to represent this association at all meetings which may be held for the purpose of furthering a Turnover Tax as a substitute for the Dominion Profits Tax and Sales Tax."

The meeting then adjourned.

Comparative Raw Material Values

The advance and decline of raw material values was outlined in a chart displayed at the meeting of the Furniture Manufacturers' Association recently held in Toronto. The figures given show percentage of increase over the prices which prevailed in 1914:

	Highest since 1914	Values prevailing Jan. 1921
Lumber	286.5%	183.7%
Hardware	137. %	104. %
Finishing	264 %	143.2%
Mirrors & glass..	257 %	156 %
Packing	210 %	169 %
All items	244.7%	166.7%

In figuring the last item, the different materials were considered in the proportions in which they are used. Thus, the latter figures represent the fluctuations in the average raw material cost of furniture.

Which is the best type of feed drive for the moulder and planer? The old fashioned cone step pulleys, or the latest variety friction feed?

Will Business Revive and How Soon?

Address by W. J. Anderson at Annual Meeting of Furniture Manufacturers' Association – Outlines Work of Organization—Prosperous Future in Store for Industry

The year just closed began under the influence of the boom created by the great war; with our factories choked with orders but with stocks depleted and raw materials scarce and very high in price. This condition prevailed throughout the early months of the new year. To meet the conditions imposed upon our industry two price advances were made, one in January and one in March. Toward the beginning

W. J. Anderson, Stratford Chair Co., Limited, Stratford, Ont.

of the month of May there was a noticeable falling off in orders and by July 1st it was evident we were entering upon a very slack summer season, as far as the furniture industry was concerned.

As there was every prospect of a bountiful harvest throughout all the provinces of the Dominion it was believed that with the harvesting of the crop, business would again revive and that the autumn months would see the stocks of furniture, that had accumulated during the slack months of summer, moving out. In this we were disappointed for as the months went by, instead of improvement in business, orders dwindled in volume, until our factories were forced to curtail production by reducing working staffs and hours of work, and finally the closing down of many factories, temporarily, during the last month of the year.

Busy Year for Association

With conditions as described it can be readily understood that it has been a busy year for our association. Many meetings of the executive of the general membership were necessary. When meetings were called, to deal with the problems that were constantly coming up, it was most encouraging to your officers to find that there was, in every case, a full and representative gathering in attendance. This fact proves that our members recognize that the association idea has brought to the industry a greater measure of strength and prosperity than it has ever before known. We are said to have the best organized industry in the Dominion. Surely then it is for us to see that we are loyal to our association and that we all co-operate for the common good and by so doing be prepared to meet the difficulties that may confront us during 1921.

Your association has been watchful of the interests of its members throughout the year. Its various committees,—Executive, Labor, Publicity, Credit and Tariff, have convened many times and have always given their best consideration to the problems presented. Notwithstanding the watchfulness of your labor committee, there was a little disturbance in labor circles. Early in April a communication was presented from Mr. Marsh, a labor organizer, accompanied by a draft of an agreement which he wished placed before the Ontario Furniture Manufacturers. Our members voted to take no action in the matter. Following this incident the Unions created trouble in three centres—Cornwall, Ottawa and Owen Sound.

The strike in Cornwall occurred in June and continued for about one week when it was settled, the men going back with some slight modification of the old terms. In Ottawa a strike occurred in July. It extended to woodworking plants in general. The manufacturers there declined to recognize the strike or claims of the strikers and the result was a victory for the employers. In Owen Sound, strikes also occurred in the month of July in several furniture plants. After running a period of about three weeks these were broken, the men going back to work on the terms offered them by their employers, before the strike was called. Following these unsuccessful attempts to force the manufacturers to recognize the demands of the union, labor seemed to settle down and during the latter part of the year the workman has been more concerned about his job continuing at present rates than about increased pay or shorter hours.

Wages Important Question

With the falling of prices of manufactured articles and reductions in the cost of living, there is a feeling abroad that labor must bear its share in the reduction. What action our industry will take in this regard is a matter for your Labor committee to consider and which will, no doubt, come before you as one of the first problems of 1921.

A new feature among the activities of the association during 1920 was the putting on of a publicity campaign which had for its object the building of a bigger market for furniture. A committee was appointed in June and given full power to proceed with the formation of the Home Furnishings Bureau. A newspaper advertising campaign started in September covering the whole of Canada. It was run in 44 Dailies, 74 Weeklies and 11 Farm Journals and continued to the first week in December. The retail

trade was generally appreciative of this advertising effort and one retailer described it as the most forward step that had ever been taken in the furniture industry in Canada.

In the month of June, when there were rumors of Luxury Tax about to be placed on furniture by the Federal Government, a delegation from the Association visited Ottawa. Several interviews were had with the Finance Minister. Your committee was able to show that furniture is not a luxury and, as you know, very few articles of furniture came under the Luxury Tax.

Owing to the broadening of our work a change of quarters was necessary about the middle of the year and which were found at our present rooms, 8 Colborne Street. Just here I would like to say a word in appreciation of our Secretary, Cost Accountant and their staffs. It has been a busy and difficult year for them. They have met every demand cheerfully and rendered loyal and efficient service in the interests of the Association.

What of 1921?

Having reviewed the events of the year, what of the future? Will business revive, and if so, how soon? As to the latter part of this question, the answer is not certain. The outlook is a little clouded but opinion is unanimously optimistic, although it is conceded that the return to normal will be slow and gradual, probably extending over the greater part of the year. The general feeling of Canadian manufacturers has a confident tone.

The demand for furniture is undoubtedly slack at the moment, but it cannot always be so. Our country, during 1920, gathered the greatest crop in its history, much of which is still in the granaries of the farmers. When this surplus grain is marketed a portion of the money will assuredly be spent in the furniture stores of the country. The retail furniture trade has been on a buying strike for practically six months and must have by this time, pretty well depleted their stocks. They ought soon to be in the market for goods.

There is a shortage of houses in every city, town and hamlet in the Dominion. With labor plentiful and wages as a result, no doubt lower, we may, with confidence, look for many new buildings to be erected this summer, which, in turn, will require new furniture. In addition it is said that there are millions of people in Europe waiting to emigrate to Canada as soon as they can get steamship accommodation. Every emigrant family will require a home and furniture.

When we consider all these factors we cannot help but be cheerful and confident concerning the outlook for the furniture industry in Canada. For a few months orders may come slowly but they will increase in volume and in due time business will again be normal. In the meantime let us exercise caution in the management of our factories. Do not let stocks accumulate. Keep labor costs and material consumption under control. Have an eye to the granting of credits. Be loyal to the principles of our association. And if we observe these things, I believe the furniture industry in Canada will successfully weather the present strain.

"Is it necessary that a foreman should be able to work any woodworking machine?" is a question often asked. He can be a good foreman without those qualifications, but he is a better one with them.

The Toy Industry of Canada

By Horace M. Sanord

Although the toy and doll industry of Canada has made considerable advance compared with pre-war times, it would appear from official statistics that the domestic demand is by no means fully met by Canadian factories, for the Dominion's imports of toys and dolls during the fiscal year 1913 amounted to $939,678 and during 1920 to $1,534,728.

The kinds of toys manufactured in Canada include animals, autos, balls, billiard games, boats, building blocks, carriages, crokinole boards, croquet sets, dishes, dolls' furniture, games, garden sets, lawn swings, pool tables, pucks, rocking horses, skipping ropes, sleighs, teeters, toy balloons, tricycles, and wheelbarrows, which are made of celluloid, enamel, iron, steel, tin, rubber, and wood. The growth of the Canadian industry is principally due to conditions arising out of the war, and at the present time some 35 toy factories are listed, although the census returns report the operation of only 15 in 1918—the latest year for which figures are available. These 15 factories represented a capital investment of $369,219 in 1918; they employed 33 salaried workers and 193 wage workers, to whom they paid, respectively $44,190 and $131,817, they used materials costing at the works $115,329, and turned out products whose selling value at the works was $405,369.

Imports and Exports of Dolls and Toys

As already stated, the Dominion required in the past year an additional $1,500,000 worth of toys to supplement the output of Canadian factories. Before the war Germany was the chief source of supply, but the United States now occupies first place, and Japan likewise has made a notable advance in its shipments of toys. The shares of the various countries sending dolls and toys to Canada in the fiscal years 1913, 1918, 1919, and 1920 were:—

	Year ending Mar. 31—			
Imported from	1913	1918	1919	1920
United States	$273,139	$785,998	$708,489	$1,136,372
United Kingdom	76,400	66,755	28,208	93,692
Austria-Hungary	6,029	.....	.....	.....
Belgium	4,239	.....	.....	.....
France	19,303	9,407	4,567	20,458
Germany	536,242	.....	.....	.....
Holland	5,205	.....	.....	.....
Japan	18,738	224,095	228,741	277,946
Other countries	383	626	2,132	6,260
Total	$939,678	$1,086,881	$972,137	$1,534,728

Last year Canada exported $139,052 worth of domestic dolls and toys, the United States taking $5,635 worth, the United Kingdom $120,322, and other countries $13,095, and re-exported $21,300 worth of foreign toys, $19,655 worth to the United States, $134 to the United Kingdom, and $1,511 to other countries.

Make Haste Slowly

Do not attempt to establish too low a level of values. If after making a reduction, prices are found to be still too high, it is an easy matter to make a further cut, but if found to be too low, it will be extremely difficult, in view of the attitude of the general public, to establish a higher level.

The day has not yet arrived when you can put the belt "on" and the machine will do the rest. You have to do your part to the machine or the results are very unsatisfactory.

An Attractive Bungalow for $3,600

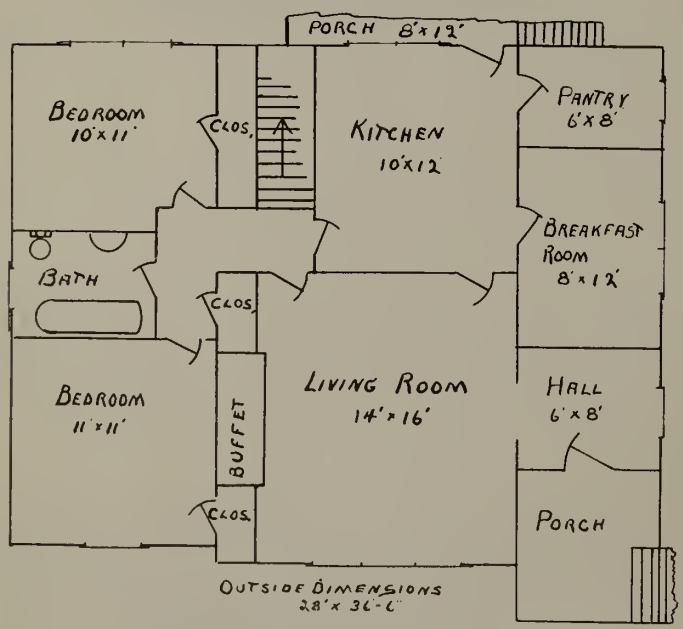
Cost Reduced by Careful Planning—Convenience and Comfort Not Overlooked — Many Desirable Built-in Features

The attractiveness of the bungalows being built under the Victoria City Housing Scheme, Victoria, B.C., may be gathered from the accompanying illustration. This home was put up for a returned soldier and represents the better type of house being erected under the above mentioned scheme. It is a conveniently planned bungalow, rather attractive in appearance, and embodies many desirable features.

The outside is finished in shingles, stained a rich warm tone, together with plastered gables. Provision is made for five rooms and bath, including a large living room with built-in buffet. In laying out the rooms, closets, etc., an effort was made to secure a maximum of comfort and convenience, coupled with the conservation and utilization of space. The reader can judge as to whether or not this objective was attained—the owners are well satisfied with the result.

The living room is particularly attractive, being nicely finished with panelled walls and convenient built-in features, including a nicely designed buffet, extending nearly the full length of one side. The buffet proper is in the centre with built-in china closets on either side. The large archway opening into the hall seems to express a warm welcome, as well as giving an impression of roominess and space. On each side of this archway are built-in cupboards with glass doors. These may be used either as bookcases or china closets. Another feature is a fine open fireplace, of pressed brick, surmounted by well-designed overmantel.

The breakfast room opening off the kitchen is a particularly pleasing feature. This is a bright, well



Layout of bungalow built at a cost of $3,600.

lighted, cheerful room, so placed as to result in the saving of many steps. Being warm and cosy, it is used with unfailing regularity.

The lighting of the whole bungalow is good. It might be suggested that an extra window in both bedrooms might be desirable, the arrangement and location of furniture must be considered and sufficient wall space provided for bed and other articles, also a door from pantry into breakfast room. Another suggestion might be to transpose breakfast room and pantry so that when a meal is served in the living

Type of house built in Victoria, B. C., under housing scheme

room the pantry is right at hand rather than in the far corner of the kitchen.

The basement, which extends the full length of the building, is finished in cement.

This bungalow was constructed by Messrs. Evans & Green of Victoria, B.C., while the plans were prepared by C. E. Watkins, architect of the same city. When completed, the cost totalled about $3600.

Plate Glass Association Makes Suggestion

Furniture manufacturers have recently received a communication from the Plate Glass Manufacturers of America, which reads as follows:

"The shortage of plate glass which has existed for the past eighteen months has been a source of embarrassment in the furniture manufacturing industry, and while the manufacturers of plate glass have exerted every possible effort to supply the demand, they have been unable to do so.

"Many millions of dollars have been invested in plant additions and enlargements, and we take pleasure in informing the furniture trade that it is the expectation of the plate glass manufacturers that the additional capacity will enable them to supply the requirements of all customers. This situation permits us to suggest that the restoration of the smaller sizes, 12, 14 and 16 inches in width, which for various reasons have for the past year been eliminated from your lines, would greatly improve the assortment of sizes which the furniture industry consumes and would be of material assistance to the manufacturers of plate glass in supplying promptly the demands of your industry.

"Yours respectfully,

"The Plate Glass Mfgs. of America."

Safety Features of Industrial Lighting

Good Lighting Means Fewer Accidents Coupled With Increased Production—High Cost of Poor Illumination—Some Pertinent Facts and Figures

By Samuel G. Hibben*

The passage of the various state and provincial codes relating to the lighting of factories and mercantile establishments brings us face to face with a new safety factor,—illumination. This is one of the least understood, yet most vital subjects that have to do with economic, humane employment and development of labor, and as our knowledge of better lighting increases, our appreciation of its influence on industrial operation increases in proportion.

In discussing industrial lighting fixture equipment and particularly its maintenance, we have entered upon an argument disclosing much that is vital in the accomplishment of all three of the desiderata of successful industrial operation, viz., production, speed, and safety. Since production depends upon the other two, or since all three are really synonomous, any arguments applying to the maintenance of a grade of illumination satisfactory for safety, will apply equally well to the others.

One may say in general that good or bad lighting depends upon two outstanding factors. Bare incandescent lamps, or unshielded glare illuminants that not only do not illuminate but cause a contraction of the pupilary opening of the eye and resultant decrease in seeing ability, form one of these factors. More or larger bare lamps only aggravate this trouble and increase the hazard,—the solution is found in the proper use of a good reflector, or a shielding fixture. The second factor is the matter of insufficient light, and this is very largely influenced by lamp renewals, reflector and lamp cleaning, and the colors of surroundings, or whatever would be involved in maintaining the original installation up to its initial efficiency. It is this very important phase of applied illuminating engineering that we will discuss.

Cause of Many Accidents

Insufficient illumination unquestionably reduces visual acuity, decreases the speed of muscular action, confuses the mind, and leads to accidents. A few figures will illustrate this point.

In the coal industry, for example, we think of a coal mine accident as resulting from falling slate or gas explosions, whereas statistics show that out of each one thousand men employed underground, there are eleven serious or fatal accidents a year, and out of the same number of employees working above ground there are five serious accidents per year. In very few industries is the illumination so wretched, either above or below ground, and this largely explains why we find the abnormally high accident rate in both places. The fire accidents that occur uninfluenced by underground hazards can be almost altogether attributed to either poor natural or poor artificial light, and doubtless more than one-third of the underground accidents arise from the same, or a greater insufficiency of light.

As another feature of the close relation between light, speed, and safety, we can cite the example of the tennis ball, which may be perfectly visible to each tennis player when held in the hand just before serving, but which when in rapid motion in the air is almost invisible, if the daylight be weak. Any rapidly moving object must register its image upon the brain before we "see" it, and as in the photography of objects, there must in human vision be sufficient illumination of that object before our eyes—our human motion picture cameras—will record a clear impression of it. Muscular action cannot begin until after our brain has "developed the film," and hence our speeding up of action, either to produce or to protect, must first start with an understanding of the time—element of vision, and an endeavor to reduce this time to a minimum, by higher lighting intensities.

What Poor Illumination Costs

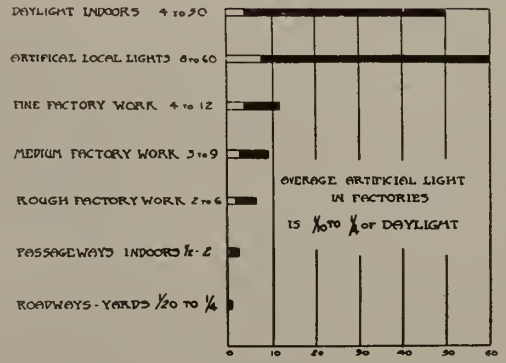
Granting, for a moment, that good illumination is largely dependent upon the care of the lighting equipment, let us see what valuation may be put on poor maintenance, in other words, what is the high cost of poor light. Figures that in general agree with insurance statistics (if they err, it is upon the safe side) show that the annual total of serious accidents in industrial plants in the United States amount to 25,000 per year. That is the minimum figure. Out of this 25,000 we find 15 per cent. chargeable to poor illumination—either unshielded poorly directed light, or insufficient light. Now, based upon the average amount of employee's compensation paid, the equivalent lost time of each serious or fatal accident traceable to faulty illumination is 850 weeks, or the total annual time lost is over three million weeks, roughly equivalent to the working life times of one thousand men. If these men were earning $25.00 per week, then practically $80,000,000 in wages are lost annually, through improper lighting. If we add to this staggering sum the doctor's bills, medicines and losses of production we arrive at astonishing figures!

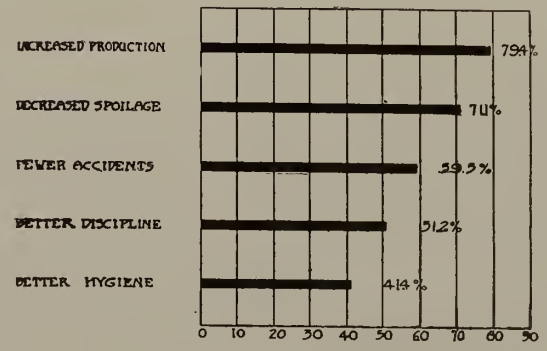
One does not often think about the fact that the intensities of artificial light in industrial plants are much below the daylight intensities. We find daylight in factories running from four to approximately fifty foot-candles; general artificial lighting in factories for even fine factory work has this year been in the range of 4 to 12; medium factory work between 3 and 9, and some times down to ½ or ¼ foot-candles for indoor passage-ways. Places like stairways, and the positions where accidents are the most prevalent are usually most poorly lighted and if daylight conditions here were reproduced even in the most meager way,—even if we only approximated daylight conditions we could reduce accidents materially because statistics show that the largest majority of accidents occur in the night shifts. The percentage is about two to one—two accidents under artificial lighting compared to one accident under daylight conditions.

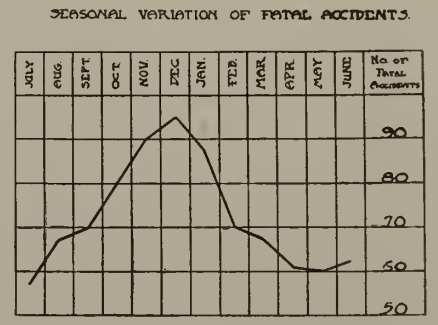
Advantages of Better Lighting

How do the manufacturers regard good lighting? Increased production,—seventy-nine per cent. of the

* Illuminating engineer, Westinghouse Lamp Co., address before Illuminating Engineering Society, New York.

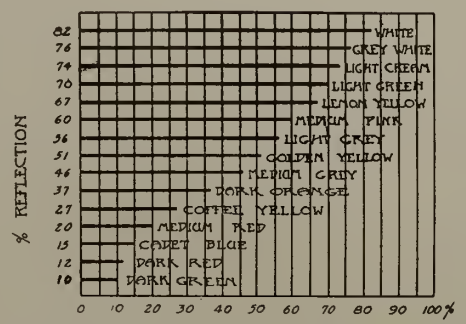




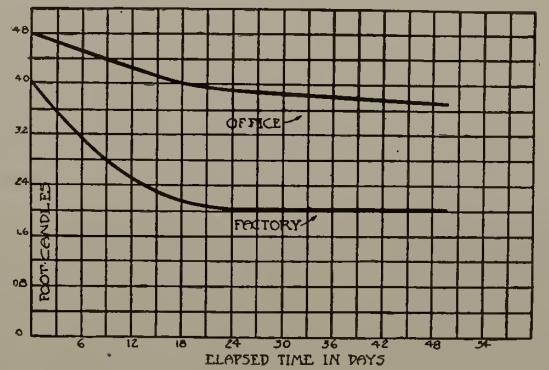


MORE ACCIDENTS WHEN DAYLIGHT IS INADEQUATE

HOW MANUFACTURERS REGARD LIGHTING

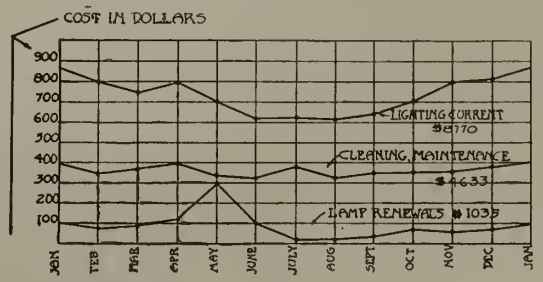


LIGHT REFLECTING VALUES OF COLORED SURFACES



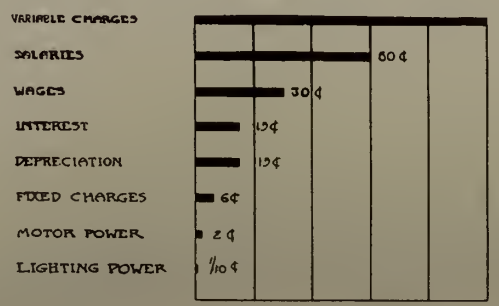
THE LOSS OF EFFICIENCY FROM ACCUMULATIONS OF DUST ON ENAMELED STEEL REFLECTORS

OPERATING EXPENSE BUILDING OF 168000 SQUARE FEET
TOTAL ANNUAL OPERATING EXPENSE $ 68,628

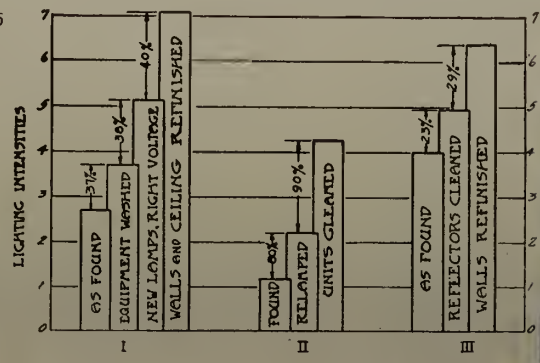


AVERAGE MAINTENANCE COST OF A TYPICAL LARGE INSTALLATION

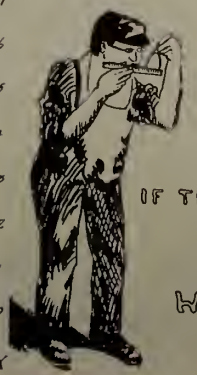
LIGHTING COST IS A SMALL FRACTION OF OPERATING EXPENSES



CHARGES PER HOUR AGAINST A MACHINE TOOL



REGULAR AND ADEQUATE MAINTENANCE IS NECESSARY



BUT
IF THE FACTORY IS WELL LIGHTED
YOU CAN LOOK
WITHOUT STOPPING!

Charts showing value of adequate lighting installation maintained at its highest degree of efficiency.

manufacturers say,—is their excuse for good lighting. Decreased spoilage, seventy-one per cent. say, is their reason. Fifty-nine per cent. of the manufacturers say that fewer accidents constitute their reason for good lighting, etc. Offhand most manufacturers admit, without any argument at all, that in half of the cases they would have fewer accidents if they had better illumination.

Now it has been shown that the total cost of accidents, the total disability payments, and the total lost time of industrial operators in the United States amount to more than the total cost of artificial illumination. We should ponder over that fact! The total cost of artificial illumination in the United States is exceeded by the cost of accidents and the loss of production resulting from poor lighting, and yet fifty-nine per cent. of the manufacturers already agree that poor lighting is directly or indirectly responsible for these accidents. Surely, then, it is logical to preach the doctrine of improvement, and the folly of inertia.

Data of reputable insurance companies prove that artificial lighting is connected in some way with accidents. In one class of labor during July and August there occur out of a miximum of some ninety-five accidents, about sixty. The rate rises in October, November and December, falling off in January, February and March, as the days grow longer, and down to a minimum again in May, June and August, when daylight is a maximum.

This is not new information at all, but it adds weight to the argument that the fatal accidents or the serious accidents prevail in the darker seasons of the year. Other items, such as poor ventilation, low temperatures, etc., undoubtedly enter into these figures, but in tropical latitudes nearly this same ratio is found to exist. Similarly, the majority of the accidents that do occur in the dark seasons occur when the daylight is insufficient.

Painting For Greater Production

Now, it can be shown how maintenance is responsible for good light, and conversely what poor light we will get when we do not consider maintenance. The first thing to do to get good illumination and to reduce the danger of the industrial accidents is to look to the interior finish of the rooms or the factories, in which we operate. This is termed "Painting for Light." In other words, we say that ordinary white paint has a reflection value of 82 per cent., etc. Consider the ceiling of a room that is finished in gray-white and with a reflecting value of about 75 per cent., then three-quarters of the light falling on the ceiling surface will be reflected. Now, if we were to neglect that fact, and were to paint our walls and ceiling medium gray, for instance, which would reflect 40 per cent. of the light, we have cut our available usable illumination practically in half. Done in the red and dark colors we get reflection coefficients that range in value to about 30 per cent. Hence one of the first things that will lead up to better illumination and fewer accidents will be the attention given to the interior finishes of the buildings.

Cleaning is essential in maintaining lighting efficiency. If a typical reflector that has been in service several weeks be wiped, its candlepower in a downward direction is increased from 1,000 to approximately 1.350, with corresponding increases in other directions. If we go a step further and thoroughly wash the unit with soapy water and ammonia, its downward light is increased to about 1,500 candlepower. Obviously a neglected lighting fixture cannot properly perform its work, and the ones that show dirt are in many cases preferable to those that do not, for they will probably be cleaned oftener.

Comparing the depreciation of illumination in the office with that in the factory, we note that the factory units suffer more. This is reasonable because we find more dust and usually an oily dust in the atmosphere of the factory. In a very dirty building, after three weeks of neglect, the illumination may drop from 4.0 to 2.0 foot-candles, and the only reason why such depreciation is allowed to continue is because the reduction is so gradual and the effects are so insidious.

If we assume or admit that cleaning of lighting fixtures and of light-reflecting surroundings is essential to efficiency, then why don't we clean? Is the cost prohibitive? It cannot be considered so, in comparison to the results secured. In a typical large building having glass lighting reflectors and rather elaborate commercial fixtures, we find that out of a total annual operating cost of lighting equipment amounting to $14,438, the cleaning and maintenance is represented by $4,633, or about 32 per cent., which may be taken as a fair proportion.

Expressed in the terms of an evaluation of the working man and his possible output, the cost of good lighting is perhaps one-tenth to one-quarter of one per cent. If we can add to the workman's output, or eliminate lost time represented by not more than two minutes per day, then the value of his output in that short length of time will equal his share of the cost of lighting for the entire day. Expenditures for oil are sometimes greater than for light—are we then evaluating the machine higher than the man?

How Better Results Were Secured

In order to show what could be done with a neglected lighting installation, three factories were taken which had conditions that are found all too frequently. Case 1 was found with 2.6 foot-candles of average illumination intensity. Washing the units increased this illumination 37 per cent. to 3.6 foot-candles. Replacing old lamp bulbs with new lamps of the correct voltage-rating produced another increase of about equal amount while finally a re-painting of the interior resulted in a final intensity of over 7 foot-candles, all without increasing the power consumption in the slightest. Cases 2 and 3 of this same experiment showed similar gains that resulted from intelligent maintenance, all adding weight of testimony to the fact that it pays to clean.

Probably the greatest safety slogan is the old railway crossing sign, "Stop, Look, and Listen!" If the factory is well lighted the employees may look without stopping!

DO YOU WANT SUCCESS?

Are you willing to pay the price?
How much discouragement can you stand.
How much bruising can you take?
How long can you hold on in the face of obstacles.
Have you the grit to attempt what others have failed to do?
Can you go up against skepticism, ridicule, friendly advice to quit, without flinching?
Are you strong on the finish as well quick on the start?
Success is sold in the open market. Any man can buy it who will pay the open price.

Have You Ever Considered Dimension Stock?

That is Material Cut to Sizes and Lengths That Would Enable You To Work It Up With a Minimum of Waste and Labor

By Wm. A. Babbitt

A practical, scientific effort to eliminate all waste possible in wood using industries is part of the program of the recently formed Association of Wood Using Industries. In this endeavor they should have the hearty co-operation of every member of the woodworking industry. The proper utilization of all lumber would not only result in conserving our rapidly diminishing forests but should assist all woodworkers in keeping the cost of their products within reasonable limits.

A brief preliminary survey of this problem developed certain outstanding incontestable facts, most of which are familiar to woodworkers.

1. The estimates of the Forest Service show that if only the economies of lumber which can easily be expected from the Conservation policy of the Association could be secured the present supplies of timber can be made permanently sufficient for the needs of the industry.

2. Under present conditions of progressive depletion of timber reserves, there has developed a corresponding factor of waste, also progressively increasing in amount, owing to the decreasing quality of lumber produced.

3. Practically all hard woods, and a large proportion of soft woods are utilized in the form of dimension, and not as plank lumber. But nevertheless, the enormously wasteful process of securing the necessary dimension for the manufacture of the products of the wood using industries, by first manufacturing plank, and then manufacturing dimension from plank, is everywhere almost universal.

4. Furthermore, the production of net dimension has never been a practical commercial proposition, except in a very limited way. There are numerous reasons for this condition, but no excuse. The fault is both with the producer and equally with the consumer. Neither party appreciated the fact that net clear dimension is worth more to produce and worth more to buy than the best grades of commercial lumber. Consequently, we have had careless and shiftless manufacturing and grading of dimension on the one hand, and an ignorant and suspicious buying policy on the other hand.

5. This situation persists in spite of the high cost of all lumber, aggravated by high rail costs. A series of studies covering over two years seems to establish thoroughly the fact that the economies and other advantages of the production and use of dimension stock are still not utilized because there are no official standardized lists for dimension, covering the requirements of the Wood Using Industries; and consequently no established market for dimension. The hazard is too great for the manufacturer of dimension. Having no great market, a cancellation means practically the total loss of the dimension he has manufactured. The hazard is too great for the user of dimension stock. If he contracts for his raw materials in the form of dimension stock and the contract is thrown up, then he has no place to replenish his stocks.

6. In addition, there are contributary causes due to the heritage of practices which were established when conditions were different. Formerly, low cost of lumber and cheap freights made it convenient to ignore these questions which are now so pressing. Once there was a time, quite recently, when we were able to buy very high grade stuff without difficulty. Now the trees that were passed up in those days are the staple of the lumber market.

No doubt all these reasons were at one time decisive. But not any more. Cheap lumber is gone. High grade lumber is increasingly scarce. Low freight rates belong to the regretted past. Moreover, manufacturers of wood products as well as manufacturers of lumber have come to understand better the utility of properly manufactured dimension stock. One great lumber association is conducting a wide spread propaganda among its members along this line.

After a careful consideration of this subject, the Association of Wood Using Industries has decided to undertake the task of standardizing the principal elements of the dimension requirements of the manufacturer of wood products, in order that the economies of properly manufactured dimension stock may be secured to the mutual advantage of all concerned.

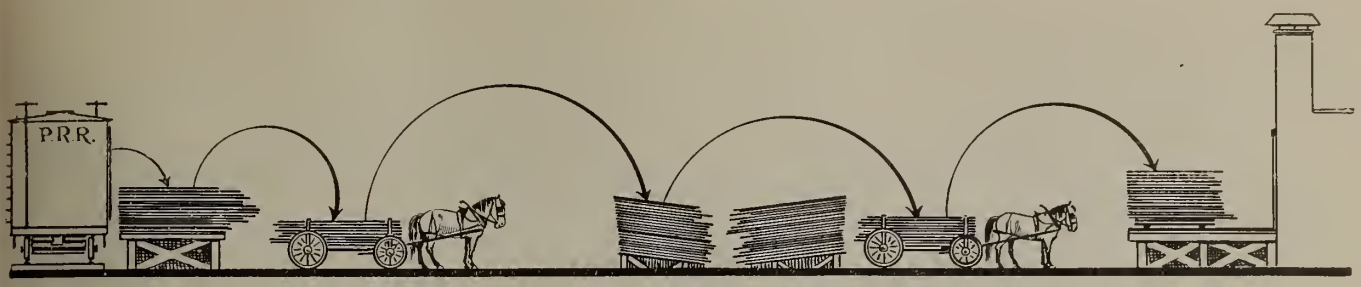
This decision has been reached not only with a full appreciation of the advantages to be secured, but also with an equally full appreciation of the difficulties in the way. It is evident that this great adventure in conserving our forest resources, with profit to the men who do the conserving, can be successful only with full and frank co-operation of all parties at interest. Nor is it to be expected that these results can be quickly secured. It is a task of years, but worth the undertaking.

The execution of the enterprise has been placed in the hands of Mr. Wm. A. Babbitt of South Bend, Ind., Chairman of the Standardization Committee. Mr. Babbitt is General Secretary of the National Association of Wood Turners, and has conducted very extensive investigations regarding the whole problem of dimension stock.

U. S. Duty on Beech and Maple

For some time the American customs officials have been classing maple as a cabinet wood and collecting a duty of 10 per cent. on all such wood imported from Canada. The board of general appraisers at Washington, D.C., recently ruled that maple be held free of duty. It is anticipated that the Treasury Department will protest this ruling. In the meantime the 10 per cent. is being collected and should the new ruling be upheld the amounts paid, since the maple was declared to be free of duty, will be refunded upon filing a claim. In this connection the Treasury Department have decided that "beech" should be classed as a cabinet wood and will in future impose a 10 per cent. levy on all shipments from Canada.

The latest application of an electric motor is one put on the shaft of a vertical boring machine. This runs at 3,450 revolutions per minute.



How Unproductive Labor May be Reduced

Placing Lumber Yard on Wheels Not Only Lessens Handling Costs but Reduces Seasoning and Handling Losses—Lumber Lift for Breaking-out Room and Mill

By C. A. Fields

The biggest problem to consider in the planning of a new up-to-date woodworking plant or the reorganizing of an old plant upon a more efficient basis, is the elimination of non-essential labor and the reduction of waste material to a minimum. In this article we shall discuss only the merits of a well systemized yard, trackage and facilities for the proper handling of lumber from car to the cutting room. Many Canadian manufacturers have installed such systems while others have the matter under serious consideration.

We must start first with the lumber yard, because here begin the ills of a poorly laid-out plant. The location of the yard switch is a very important matter and one that often demands quite a little ingenuity, especially so in a small plant where the one switch handles both the incoming raw materials and the out going finished products, since the shipping department is usually at the opposite end of the factory from where the raw materials enter. In this case it is usualy more practical to locate the tracks along one side of the factory, giving access to both the receiving and shipping departments. Where the size of the plant requires a special switch in the lumber yard, then it is usually best to put this to the extreme rear. However, the location of switch trackage is one that depends to quite an extent upon local conditions, and can not be placed always in the most convenient spot.

Unnecessary Labor Expended

There are a number of disadvantages to cope with in the old yard system of taking lumber from the box cars, and with wagons or conveyors transport it to some desirable part of the yard and here stick it for air drying, then after a few months the carefully piled stock is again loaded on wagons and removed to the dry kiln platform and here loaded on to the kiln trucks. Quite often the system of handling after it comes from the kiln, is just as cumbersome. The largest item of loss, in such a system, is the heavy expense of rehandling the lumber, which runs anywhere from one to three dollars per thousand and has been known to even exceed this cost. The accompanying diagram shows five distinct operations in getting the lumber from the car to the kilns, this is not overdrawn. Many superintendents or factory managers do not stop to consider that this work could be accomplished in one operation with a very small initial cost.

Another loss, occurring under such a system, is the deterioration of lumber through season checks, warping, sun casehardening, etc., and the loss and breakage due to frequent handling. Still another item of disadvantage, and one not to be overlooked, is the fact that a large capital is necessarily tied up in stock that is not moving toward production, thus retarding a quick turn-over of the company's investment.

A better method is handling direct to kiln trucks. This can be accomplished by laying green storage tracks parallel or at right angle to the railway switch These should be of a length to hold at least as many trucks as the kiln. Not a few firms put a trackage system throughout the entire storage yard and eliminate the piling system altogether. Such a system must have a number of transfer tracks so as to give flexibility, permitting of moving stock from any part of the green storage to any one of the dry kilns. In extremely large plants, where a million feet of lumber is a small item, electrically driven transfer cars are used for this purpose.

Importance of Proper Layout

The dry kiln layout is the next step to be considered and is the most important, for the dry kiln is, as it were, the gateway to the factory. The layout of course is not so important as the functioning of the kilns themselves, for they are responsible for the success of one of the most important phases of commercial wood manufacturing. The success of the drying operation is determined by the right type of kiln for that particular line of work and the part played by the kiln operator in directing this initial process of manufacturing. Volumes could be written on this subject but we shall dwell only on the kiln layout. The most logical layout is to build the kilns at the end of the green storage tracks and if possible with a transfer system between the two. Whether the kilns are to be opened at both ends is to be determined by the type of kiln used and should be decided by a dry kiln engineer. In case they are opened at both the receiving and discharging ends it facilitates the moving of the trucks by having another transfer system at the discharge end, with the dry storage on the opposite side. The size of dry storage shed should be the same capacity as the dry kilns. Quite often we find the dry storage along the side of the kilns, whch is not a bad arrangement where there are only a few kilns, but it is not feasible in conjunction with a large battery. The most important thing is to "have" a storage shed and if possible, situated so as

to be easily accessible from the kilns and to the cutting room. This permits the stock to progress from green storage to kilns, from kilns to dry storage and then to cutting room.

Lumber Lift for Greater Production

The tracks running into the cutting room will terminate at the cut-off saw, rip-saws or planers, as the case may be. In many of the modern woodworking plants lumber lifts are employed to lower the kiln trucks so that the saw or planer operator works from the top of the truck, on a level with his table. This eliminates the expense of one or two men employed in repiling, which normally soon amounts to the initial cost of the lift. These can be arranged so that one lift will accommodate two machines. The writer has not noticed any of these devices in use in Canada but has seen them used successfully by such firms as:

Ford Motor Co., River Rouge Plant, Detroit
Briggs Manufacturing Co., Detroit.
St. Louis Manufacturing Co., St. Louis, Mo.
Home Furniture Co., York, Pa.
Seiling Furniture Co., Railroad, Pa.
Ebert Furniture Co., Red Lion, Pa.

The sketch at the bottom of this article is only one of the many ways in which lumber handling can be systemized. It makes no difference how your yard lies, whether square or triangular, a storage system can be so designed as to meet your particular needs.

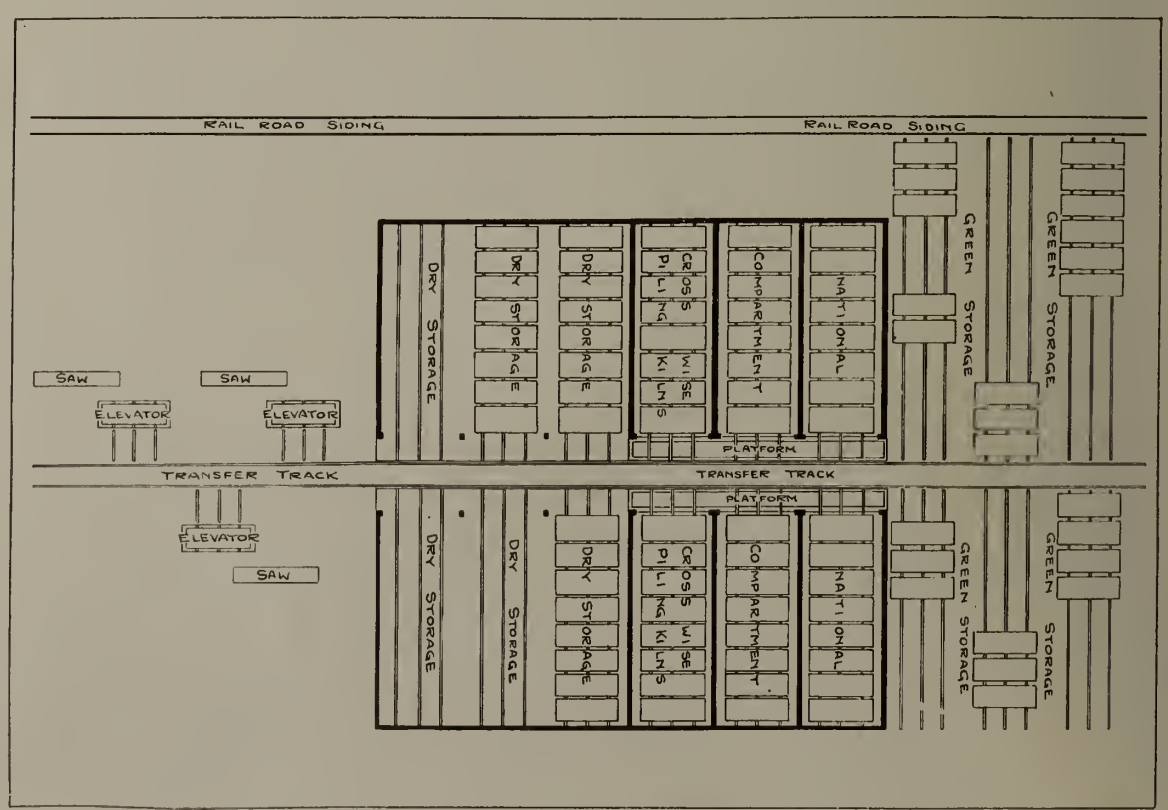
With such a system, different kinds and thicknesses of lumber can be kept on separate tracks. No matter what your drying schedule may call for, your kiln operator can move any specified stock. You can always get your oldest lumber into kiln without trouble. A large surplus air drying stock is not necessary. This enables a quick turn-over in investments and lessens the risk of a large stock on hand and a declining market. Such a system is a paying proposition any way you look at it. Some firms have realized as much as a thirty-five per cent. saving in one year. This may be a little high for an average but a pencil and paper and a little sound thinking on the part of the manufacturer will enable him to approximately figure out the solution to his own lumber handling problems.

Ascertaining Moisture in Staves

A large American user of wood staves has rather a novel way of determining the moisture content of the cooperage stock as it arrives. This manufacturer produces a line of corn syrups and requires an especially tight barrel. Considerable trouble has been experienced at times owing to the fact that the staves were not sufficiently dry. Now when a carload of staves is received, a number of samples are taken at random from different places in the car and tested as follows: A hole is bored in the centre of the stave (boring in the centre does not injure the pieces as it can be used as a bung stave) and the shavings placed in a broad-mouthed cork stoppered bottle, being sure that the borings are not subjected to air or sun. Each individual lot of shavings is then weighed and placed in a small warming oven which is maintained at a temperature of 212 deg. for six hours. They are then removed and weighed again and the difference noted.

In actual practice the container is weighed with the shavings. For example, the weight of dish 15.75 grams; the weight of dish and shavings 25.75 grams; the weight of dish and shavings after drying 23.13 grams; difference 1.62 grams, or 6.2 per cent. moisture.

This manufacturer believes that if every stave and heading concern were to adopt a similar method of testing staves for moisture content, it would mean a big boost for the wooden barrel industry as satisfied users are the best advertisements for any product.



Showing how lumber yard may be placed on wheels, effecting big saving.

Order No.	Date	Name	Address	Description	Material	Quantity L Ft.	Quantity Sq. Ft	Price	Bench Work Hours	Bench Work Price .85	Machine Work Hours	Machine Work Price 1.30	
6	June 8	Tom Smith	Cayuga	Counter, etc.	Pine Flooring		130	12.35	3½	2.98			
	" 9				2x6 Pine		30	2.70			2¾	3.58	
	" 10				1½ Pine for Sash		34	4.08	5¼	4.46	4	5.20	
	" 11				Oak for Top & Mould		65	13.00	7	5.95	1	1.30	
	" 12				Glass stops Pine	125		3.60	4½	3.83			
	" 14				Top and Bevel		32	6.40	3½	2.98			
	" 15				For Casing Pine		8	80					
	" 16				Oak Edge	20		1.25	4	3.40			
					Window Slip	110		3.30	6½	5.53	1½	1.95	
				(D)				47.38		29.13		12.03	88.54
								$88.54	Cost of Job				

Form "D" as shown in January Canadian Woodworker. This constitutes the cost book.

Simplified System for Keeping Mechanics Time

H. T. Diderch Suggests Development of Cost-Keeping System Described in January "Canadian Woodworker"—Accurate Yet Simple Method of Keeping Time

In commenting on the article on planing mill costs which appeared on page 83 of the January "Canadian Woodworker," H. T. Diderch, of the Millwork Cost Information Bureau, Chicago, suggests that on form "D," there is, apparently, no division between factory or manufacturing cost and total cost, which represents factory cost plus the addition for selling, warehousing and general administrative expense. Without a distinction between the two costs, a manufacturer has no means of knowing whether it is more profitable to manufacture a given article, or to buy it on the outside and simply act as a jobber. If you will refer to the article, "Are You Applying Burden Properly?" which was published on page 87 of the December "Canadian Woodworker," you will find additional reasons for setting up what we term a "commercial burden."

The time ticket shown as form "B," is also open to criticism for the reason that it requires the workman to perform too much clerical labor and, again, it is not conducive to accurate reporting of time. The workman is not required to be as specific as he might be if form "A," shown in the accompanying illustration was provided. With this type of time ticket, the workman's writing is confined to entering his number and the number of the orders on which he works. It is also based on calculating all elapsed time in intervals of six minutes, which, because they represent tenths of an hour will produce closer results than if th workman is obliged merely to enter 3½ hours, 1 hour, ½ hour, etc. If a workman is allowed to compute the elapsed time himself, the tendency is always to break on full or half hours, and usually the time he marks down is more of a guess than anything else.

These tickets are the same on either side except that on one side the time runs from 7 to 12.30 while on the reverse side it runs from 12.30 to 6. Each department, such as machine, bench, finishing, etc., would have its own ticket. This tends to avoid confusion. Each workman uses one card a day.

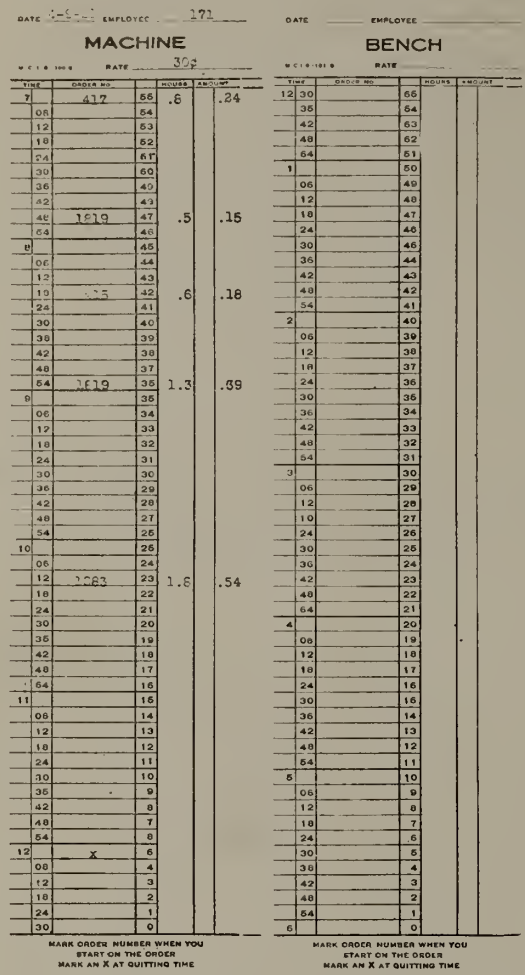
In actual practice it works out as follows: Say workman 171 gets his time card in the morning and puts down his own number opposite "Employee." At 7.00 he starts on Order 417. This number he puts down in the "Order No." column opposite 7 o'clock. At 7.48 he starts on Order 1819 and marks the card accordingly. The machine breaks down at 8.18 and the workman marks, say "x15" or whatever the number is representing the proper ledger account for machine repairs. At 8.54 the necessary repairs are completed and work is resumed on Order 1819. He starts on Order 1283 at 10.12 and quits for lunch at 12.00 marking as "X." After the noon hour he turns over the card, puts his own number opposite "Employee," and since he did not complete Order 1283 in the morning, enters this number opposite starting time or 1 o'clock. He is still working on this same order at quitting time, so he puts down an "X" at 6 o'clock and turns in his card.

After the time card has been turned in, the timekeeper or cost man fills in the "Date" and the "Rate" and starts figuring the card. The rate in this case is $.30 wages per hour. To the right of the order number is a column of calculating numbers from "O" to "55." These numbers represent tenths of hours. On the morning side 12.30 is used as "O" and 7.00 as "55." while on the afternoon side 6.00 represents the "O" and 12.30 the "55." This gives 55 tenths hours—5½ hours—between 7.00 and 12.30 or between 12.30 and 6.00.

To the right of Order 417 is the calculating number "55" and of the first 1819 is "47." To get the elapsed time between 7.00 and 7.48, the timekeeper deducts 47 from 55, giving 8 tenths hours. In like manner 42 from 47 gives 5 tenths hours. These tenths are put down in the column marked "Hours." After the time

is computed it is reduced to dollars and cents by multiplying by the "Rate" and the result in the "Amount" column.

These final amounts are passed to an assembly sheet and from that to the cost cards or whatever form


DATE EMPLOYEE

MACHINE

RATE 30¢

TIME	ORDER NO.	HOURS	AMOUNT
7	417	55 .6	.24
06		54	
12		53	
18		52	
24		51	
30		50	
36		49	
42		48	
48	1819	47 .5	.15
54		46	
8		45	
06		44	
12		43	
18	1825	42 .6	.18
24		41	
30		40	
36		39	
42		38	
48		37	
54	1819	36 1.3	.39
9		35	
06		34	
12		33	
18		32	
24		31	
30		30	
36		29	
42		28	
48		27	
54		26	
10		25	
06		24	
12	1283	23 1.8	.54
18		22	
24		21	
30		20	
36		19	
42		18	
48		17	
54		16	
11		15	
06		14	
12		13	
18		12	
24		11	
30		10	
36		9	
42		8	
48		7	
54		8	
12	X	6	
06		4	
12		3	
18		2	
24		1	
30		0	

MARK ORDER NUMBER WHEN YOU START ON THE ORDER
MARK AN X AT QUITTING TIME

DATE EMPLOYEE

BENCH

RATE

TIME	ORDER NO.	HOURS	AMOUNT
12 30		66	
36		64	
42		63	
48		62	
54		61	
1		60	
06		49	
12		48	
18		47	
24		46	
30		46	
36		44	
42		43	
48		42	
54		41	
2		40	
06		39	
12		38	
18		37	
24		36	
30		36	
36		34	
42		33	
48		32	
54		31	
3		30	
06		29	
12		28	
10		27	
24		26	
30		25	
36		24	
42		23	
48		22	
54		21	
4		20	
06		19	
12		18	
18		17	
24		16	
30		16	
36		14	
42		13	
48		12	
54		11	
5		10	
06		9	
12		8	
18		7	
24		6	
30		5	
36		4	
42		3	
48		2	
54		1	
6		0	

MARK ORDER NUMBER WHEN YOU START ON THE ORDER
MARK AN X AT QUITTING TIME

Convenient time keeping form. Original 12 inches long. Illustration shows front of machine ticket and reverse side of bench tickets.

may be used for tabulating and summarizing the completed costs. It will be seen that the use of a time ticket of this general type not only simplifies the keeping of his time by the mechanic but lessens the work in the cost and time-keeping departments.

Let This be a Lesson

Ian Inman recently met with an accident in a plant in St. Thomas, Ont., which might have had a fatal termination. In some way his sleeve was caught in a setscrew of a rapidly revolving shaft. He was whirled around, his clothes completely torn off and thrown on top of a saw. The only thing that saved him was the fact that the saw was adequately protected with an efficient guard. This serves to illustrate the wisdom of having all saws and similar pieces of equipment provided with suitable guards, also the folly of running shafting or other moving parts from which such set screws are allowed to project.

Attempt to Stimulate Building

A Home Building Exposition is to be held in the Board of Trade Buildings, Winnipeg, from March 28 to April 2. More than 100 firms dealing in builders' supplies and home furnishings will put on exhibits.

To encourage attendance at the show, each adult visitor will receive a coupon which will give him or her a chance to obtain free, for the moving away, a model cottage, thoroughly and fully equipped and valued at about $3,500. This model cottage will be one of the features of the exposition. It will be 22 x 40 and will be complete except for the foundation. It will include strictly model rooms, special care being given to equipping the kitchen.

Among the dealers who will exhibit, are, lumber concerns, sash and door factories, electrical goods merchants, plumbers, hardware men, dealers in heating equipment, paint and glass firms and furniture dealers. The Winnipeg Paint Club will put on a special demonstration.

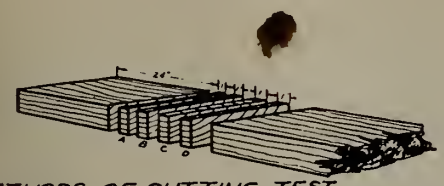
The following have been appointed on the various committees: Harry Agnew, chairman of the general committee. Chairman of the various sub-committees were appointed as follows: Building plans committee, Fred Lamar; bungalow committee, R. J. Crawford; building loans and finance committee, H. T. Hazleton; booths committee, M. McInnes; display committee, L. C. Stephens; educationl, D. B. Sprague; floor, A. J. Taylor; home sites, E. J. Ransom; publicity, John Davidson; transportation, W. E. Milner.

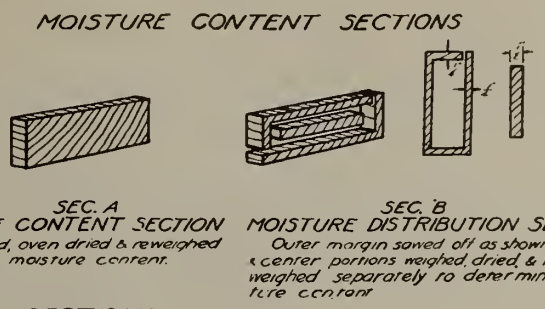
H. H. Lincoln, with offices at 706 Confederation Life Building, is secretary and manager of the exposition.

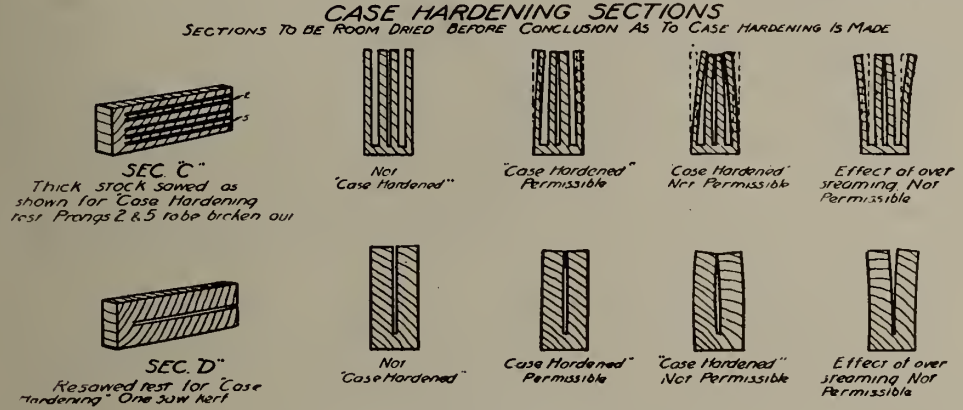
Is Production Being Encouraged?

A phase of the present economic situation which appears to be more or less neglected is the relation which is being maintained between production and consumption of commodities and manufactured articles. Declines in some lines of raw products have been so severe that it is claimed prices are now considerably below the cost of porduction while the same is claimed for some manufactured goods. The natural result of this will be that production will fall off and has already done so in some lines, with a consequent reduction in the supplies available. While there has been little said about this side of the matter as yet, statements have been made by various parties at different times that a shortage of goods would be the effect of the buyers' strike if continued too long. Taking a hint from these expressed opinions some buyers came into the market at the right time and got bargains. Others who are holding out may be the losers thereby.

Whether there is great activity or not in business there is always a certain volume of goods being absorbed and unless production is sufficient to make this good and prepare for the normal demand when it comes there is likely to be embarrassment later on. Moderate buying would appear to be a necessity if healthy conditions are to be maintained in this regard. If production does not receive sufficient encouragement a "producers' strike" is liable to result and with it there may be a scramble for goods which will undo a large part of the work of deflation which has been done.—Bradstreet's.







Tests which indicate condition of lumber.

How to Tell When Lumber is Ready to Take from Kiln

The two things which a dry kiln operator must be able to prove at the end of a kiln run are that his lumber is as dry as is required and that it is free from invisible seasoning stresses which would cause warping when the wood is resawed and shaped into furniture or other products. Neither of these points can be proved by examination of the outside of the lumber. They are easily determined, however, by the following tests which have been devised by the U. S. Forest Products Laboratory, Madison, Wisconsin: Before the lumber is removed from the kiln, choose a fairly representative board from each truck load of stock. Cut four 1-inch cross-sections (A, B, C, D) from the board at least 2 feet from the end.

Use section A to find the average moisture content of the dried stock. To do this, weigh the section immediately after cutting, on a balance accurate to 1/10 of 1 per cent., and then dry it on a steam pipe or in an oven at 212 deg. F. until it reaches constant weight. The weight lost during this drying is the weight of the moisture which was in the section. Divide the weight of the moisture by the weight of the oven-dry section and multiply by 100. This will give the percentage of moisture in the section and also in the stock in that part of the kiln from which the sample was taken. For furniture manufacture and other high grade uses, the moisture content of any board in the kiln should not vary by more than 2 or 3 per cent. from the final moisture content specified.

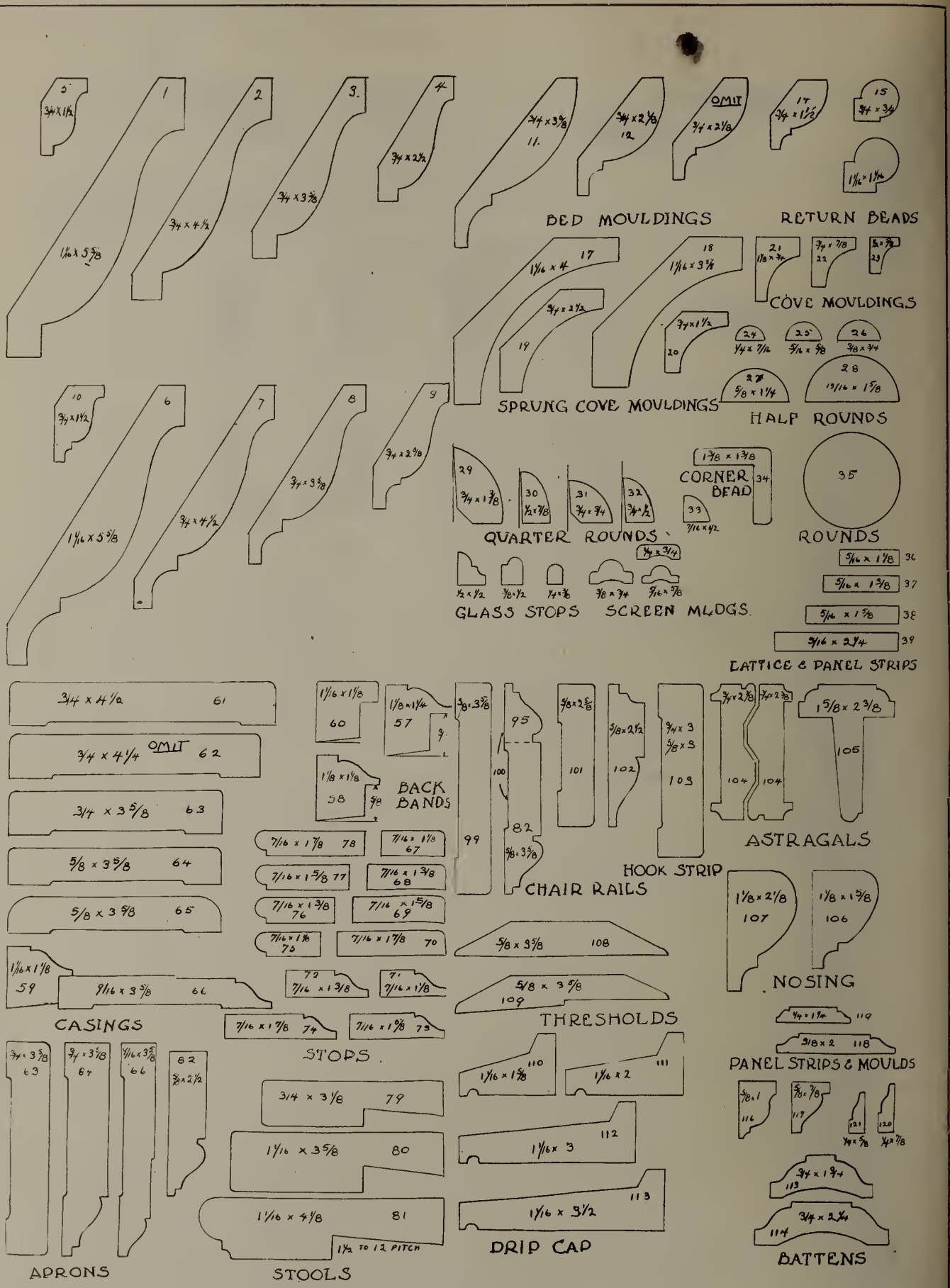
Use section B to find out whether the stock is uniformly dry from centre to outside. In order to do this the section must be cut apart and the moisture content of the inside and outside found separately. If the stock is 1½ inches or more in thickness, cut the section parallel to its edges to get an outer shell of material ¼ inch thick. Trim the remaining block equally on all four sides to leave a core ½ inch thick. If the stock is less than 1½ inches thick, cut section B so as to get an outer shell and inner core each 1/5 the total thickness of the section. Find the moisture content of each piece by the method used for finding the moisture of section A.

The moisture content of the inside and outside of the stock should be equalized, by steaming if necessary, to within 2 per cent. before the lumber leaves the kiln.

The third and fourth sections, C and D, are for casehardening and moisture distribution tests. Saw section C parallel to the wide faces of the original board to form tongues or prongs, leaving about ½ inch of solid wood at one end of the section. If the stock is less than 2 inches thick, make 5 saw cuts. From sections having 6 prongs break out the second prong from each side, leaving two outer and two central prongs. From sections having only 3 prongs remove the centre prong. In section D saw one central saw kerf to form two prongs. Stand the sections on end in some convenient place in the shop to dry.

Observe carefully the action of the prongs from the moment of sawing. Do they bow in or out or remain straight on the saw? Do they change shape after room drying? If the prongs remain straight both on the saw and after room drying, the lumber is perfectly seasoned, being free from stresses and uniformly dry throughout. If the prongs remain straight on the saw but turn in after room drying, the moisture distribution is uneven, the surface being drier than the inside. A short steaming treatment to balance the moisture content should relieve all stresses.

If the prongs turn in on the saw and do not turn out after room drying, the lumber is "casehardened" and is drier outside than inside. Use a steaming or high humidity treatment to moisten and soften the surface. The shrinkage of the outside in redrying should relieve the interior tension, and cause the stresses to disappear.



Sizes and designs as suggested by committee on standardization.

Standardization of Moulding Designs

Representative Committee Select Series of Designs—What is Purpose of Moulding —Elements of Good Design—A Very Important Question

By J. R. Wier

The question of uniform sizes and designs for mouldings and interior trim, which have been engaging the attention of thoughtful woodworkers, seems to be in a fair way of being solved. A committee, consisting of woodworkers, builders, retailers and architects, representing various associations, met recently in Chicago, under the auspices of the National Lumber Manufacturers' Association, and tackled this problem from all angles. While this was merely an advisory committee, without authority to officially adopt any designs or sizes on which they might decide, it is probable that there recommendation will be accepted and carried out by the different associations and firms represented.

In adopting standard designs it was essential that the theory and purpose of mouldings be thoroughly understood so that an intelligent choice or selection might be made. Mouldings are designed primarily to obtain or give lines, shadows and graduations of shadows. Fillets, like the conjunctions "and" and "but," are used to separate certain sections of a pattern. In no case should a fillet be large nor should the underside, the soffite, exceed the vertical face, furthermore no curved moulding is complete without a fillet.

What Constitutes Good Design

The difference between commonplace mouldings and fine mouldings is just the difference between the Roman and the Greek mouldings. The Roman mouldings have sections which are parts of circles; the Greek parts of eclipses, parabolas and hyperbolas (Parabolas are curves produced by planes cutting a cone parallel to its sides; hyperbolas are curves produced by planes cutting the cone parallel to its vertical axis). Parts of circles are of use for large beads and tori. Stock mouldings are as a rule composed of commonplace sections of circles.

In a moulding made up of a compound curve, such as the ogee, one or the other of the curves should dominate, either the concave or convex factor. Bevels are not to be considered as mouldings but should be used as chamfers only. All combinations of mouldings are based upon alterations of concave and convex sections, one or the other of which should be dominant in the combination. These curved sections may be separated from each other by one or all of the following factors, vertical flat surfaces or facias, small beads and fillets, or small fillets.

Finished Sizes Carefully Considered

In working out a set of what might be termed standard designs, every consideration was given to the contour and details of the mouldings, in many instances the curves being redesigned to conform to the best practice. The size was not overlooked for it we recognized that standard patterns should be of such a size that they may be manufactured economically from stock or standard material. Thus the sizes finally decided on were those that would work to best advantage, with a minimum of waste from standard material. In working out a design for a moulding, it must be worked out with every consideration to height and thickness. The thickness should be restricted for it must be possible to carry out the curves in proper proportion, not forgetting to omit the use of the compass unless rounds and half rounds are being made.

In deciding on the number and shape of the mouldings recommended, various catalogues and moulding books were checked. In the majority of books now in force there are some 275 to 325 patterns shown. These have been reduced to 160 and it is thought that this reduced assortment will fill all requirements of the building and contracting field.

Groove in Drip Cap Essential

During the discussion on the various mouldings it was suggested that the half round groove in the underside of the drip cap be eliminated. E. S. Hall, an architect, objected, stating that his profession considers the groove to be essential as it keeps the water from running back on the wall and prevents the face of a building from being defaced by such drip. In addition, the dirt is liable to collect and if there is no groove, the water will run back and wash the dirt down the face of the building, making those unsightly stains so often seen on some buildings. With this groove, the water drops and does not run back.

The standardization of moulding designs and sizes, together with the elimination of obsolete and little-called-for designs and odd-sized mouldings, is very desirable from the standpoint of the woodworker and sash and door manufacturer. If such a move were coupled with the adoption of uniform door and window openings, it would still be better for the industry. Special mouldings, special frames, sash and doors of odd sizes, are expensive to make and all add to the cost of building.

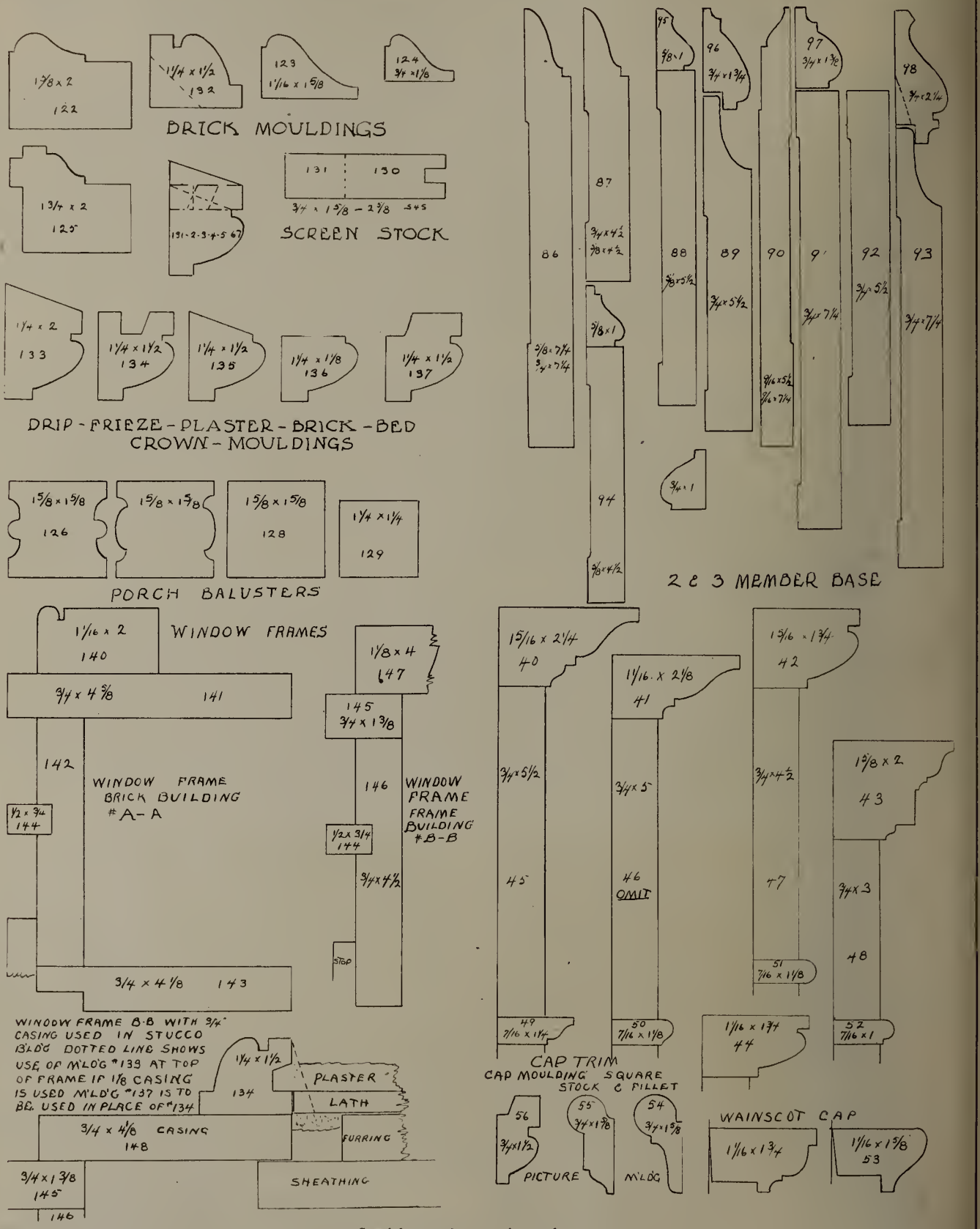
Real Benefit to Industry

A reduction in building costs, one that would assist in stimulating construction and thus help re-establish the woodworking industry on a stable, active basis, could be brought about by adopting a uniform set of moulding designs, uniform door and window openings, and the cutting and assembling of frames, interior trim, etc., at the factories. If this were done, a builder would be able to call for trim for so many windows and doors of a standard size. It could be cut in the factory, and the heads, etc., assembled, with a minimum of waste, and put in place in the building with a small expenditure of time and money.

The accompanying illustrations show some of the standard mouldings as recommended by the advisory committee. This will be followed by another series in the March "Canadian Woodworker."

This Island a Paint Factory

Mullet Island, a tiny volcanic formation protruding from the Salton Sea, has been discovered to be a natural paint factory. An apparently endless supply of material which is used as paint is taken from a small crater.



Special attention to size and contour.

How Long-Bell Manufacture Sash and Doors

Grades of Stock Based on Cutting Values—Sized Dimension Material Stored in Warehouse and Issued on Requisition—Careful Inspection to Insure Perfect Product

By H. J. Barrington

In the manufacture of doors, produced from California White Pine only, we use the grades suitable from a standpoint of cutting values as well as for softness and beautiful white appearance and figure. The lowest grade worked is No. 3 Shop. This grade produces only a limited amount of door cuttings and is used largely in the production of sash, for which it is specially selected. The cuts which are not suitable for door or sash cuttings are usually put into box shooks for the California fruit trade, and the shorter cuts put into base and plinch blocks, or core blocks for the hardwood veneer doors produced in our eastern plant.

Our next grade worked is No. 2 Shop, which usually produces 33½ per cent to 40 per cent in door cuttings of a combined grade of No. 1 and No. 2. In working this stock our main cuts are doors and the balance of the plank is put into sash or box cuttings, as in the case of No. 3 Shop. No. 1 Shop is usually the highest grade put into sash and doors and while we have occasionally used higher grades such as No. 3 Clear, or No. 1 and 2 Clear, from a standpoint of cost we cannot afford to do so on account of the market value of the plank.

The No. 1 Shop produces 50 per cent to 70 per cent of door cuttings combined grades of No. 1 and No. 2. The balance of plank is put into sash cuttings, box cuttings, base and plinth blocks, factory lath, moulding or core blocks.

The grading of shop lumber requires years of experience and that is our first consideration in the sash and door operation. The shop lumber of a type suitable for a sash and door operation is only produced from the larger logs as our small logs usually run strongly to the commons. The sawyer must use the best judgment in turning his log so as to produce the shop grades in suitable thickness and widths. Narrow widths of shop lumber are not at all times suitable owing to large amount of waste in ripping and care must be taken to produce the widths that are most suitable. This applies not only to the sawyer but to the edgerman as well—as a good piece of shop lumber 16 inches wide ripped to two pieces 8 inches wide may mean considerable loss in cutting values. For this reason we give considerable attention to shop lumber as well as all other grades from the time the log reaches the sawyer until the finished product is put into cars.

All lumber produced in the sawmill is carried out onto a sorting table and shops are here graded according to cutting values and loaded on trucks to the dry kilns.

The lumber used in door manufacture must all be kiln dried. It must also be dried properly to prevent warped and twisted stock, which is not suitable for doors and naturally means a loss to the operation. Shop lumber is kiln dried in from seven days to two weks, depending on thickness. The lumber is run out on tracks from the kilns on kiln trucks to the unloader where it is again graded and sorted ready for the sash and door operation. Thicknesses are confined to 1-inch, 1¼-inch, 1½-inch and 2-inch.

In our cutting department we use two surfacers for the planing of shop lumber for sash and door pur-

Unloads a kiln car in 12 minutes. Equipment used in Long-Bell plant.

poses. To produce the best door from a standpoint of manufacture the surfacing of shop lumber requires constant attention, as rough milling or tearing of grain means a loss in grade and values. For this work we use one 30-inch Berlin surfacer, and one 30-inch Woods surfacer. Each machine has one operator and an off-bearer and lumber is loaded on factory trucks for the next operation, ripping.

Shop lumber, strictly speaking, is a factory lumber intended for cutting up purposes and unlike most other grades it is graded according to percentages of door cuttings it will produce and not according to defects. The kind, size, or number of knots in a plank does not affect the grade so long as they are so placed as to leave certain percentages of door cuttings of given widths and lengths. For this reason it is very important that the men employed in ripping and cutting shop lumber be capable graders as well as expert cutters.

Getting the Most From Stock

Our machines for the ripping of this stock are Berlin band ripsaws, and the five machines have an expert ripper for each. The ripsaws have a specially constructed saw guide whereby it is possible to rip to any standard door width or sash width without making any adjustment for each width. The ripsawyer turns each board in its turn, and rips them to one or more pieces of widths which in his opinion will give the best return in door cuttings and values. Stile rips are naturally given first consideration as they carry the highest values, being the longest cuts. The rest, in their turn as to cutting values are long panels, cross panels, bottom rails, lock rails, top rails, long munts, short panels, and short munts. Rippings that are too narrow for doors are used for sash or mouldings, depending on grade and width.

Each ripsaw has an off-bearer and the rippings are placed at the various cutting tables located behind the machines. Lumber is distributed among the cut-off tables according to widths, as from the standpoint of economical handling as well as proficiency in cutting, the best results are secured where a cutter handles only one width.

Money Saved or Lost

For the cutting of shop lumber we use twelve specially constructed cut-off tables, each of which has a lever patent stop. These stops are so arranged that it is possible for the cutter to cut any length from the shortest box cutting to the longest stile cut used in the operation. The cutter of shop lumber must use quick judgment as time is an important factor in the cutting operation, but nevertheless, it is highly important that full values be produced from each plank as well as to keep the waste down to the minimum. A poor cutter may cut up a plank with very little waste and at the same time lose dollars in cutting values.

The cuts as produced are distributed by the off-bearers on factory trucks according to lengths, widths and grades of sash and door cuttings or box cuttings and as rapidly as trucks are filled up the door cuttings are taken to the cut stock warehouse.

To reduce the cost of manufacture, sash rips are very often produced in double widths and the cuts are taken to rip saws for re-ripping to proper stock sizes.

For the re-working of box parts we have two single Mershon resaws, one twin Mershon resaw and two California cleat machines, and all box parts are ripped, resawn and bundled in standard sizes before going to the shook warehouse.

Panel stock is resawn and taken to pony planers for surfacing. This is also true of any rough milled stock that develops in a day's cutting. For the purpose we use one Berlin and one Whitney pony planer.

Large Quantity of Material

The average daily capacity of the cutting department is about 75,000 feet and there are about 125 men employed. The final grade on all sash and door cutting is made in the cut stock warehouse. A close inspection is made there of all stocks coming from the cutting department and after being passed on, the stock is distributed to the piles according to size and grade. Any stock which does not pass inspection is returned to cutting department for reworking.

Door stock is taken from the cut-stock warehouse in quantities, sizes and grades to meet the daily requirements. An individual order covers each operation, whether it be for stock doors or a special order for a customer and an exact number of pieces of stiles, rails and panels are taken to the door department to meet the requirements. These are in their turn taken to the stile borers, rail borers, tenoners, stickers, jointers, shapers, dowel and glue machines, before being finally assembled at the put-up benches. For the work we have two double end tenoners, one single end tenoner, three large stickers, two small stickers, two stile borers, two rail borers, four sanders, one jointer, one shaper, and three glue machines.

After each operation the stock is passed on for any defective work that may develop.

Assembling and Final Inspection

Panels are sanded and then taken to the panel raisers. The final grade is made here before they are taken to the put-up benches. We have four put-up benches, each of which is handled by two men, and the parts after being properly assembled are driven together with a rubber mallet. Doors are passed to the clamp operator, who in turn clamps the door so that all parts fit snugly in their proper place. This operation is completed by sponging the glue off the face of the door, after which the door is allowed to set for twenty-four hours to give the glue sufficient time to harden.

The final operation is completed next day when the doors are sanded. This being the last inspection before warehousing, each door is carefully passed on as it comes through the sander for any defective manufacture or poor grading. Defective doors are taken to the bench-room for repairs. Sash doors, requiring stops, specially cut-in lights, or stool and water table are also taken there for the final work, after which they are taken to the door warehouse.

Should there be any doors passed on during the door operation either as to grade and manufacture, or any defective doors develop in warehouse either through rough handling or opening of joints and warped panels, they must again pass inspection at the cars at time of loading. Each door is handled separately and passed by two men before going into the stacks in the car.

Different Proceedure on Sash

The sash department is different from the door department, due to the fact that we do not carry any stock windows. Each order is handled separately according to the sticking and opening sizes. Demand

for windows varies in different parts of the country in sizes of stiles, and rails, and in our operation we make California sizes, Western sizes, New York sizes, Philadelphia sizes, Ohio sizes, Baltimore and Richmond sizes, and othes too numerous to mention. To reduce costs we bunch the runs of any particular opening and sticking but each order is handled separately for stiles, top rails, check rails and bottom rails. Stock is taken from the cutstock warehouse in quantity to fit each order and in its turn goes to the tenoners, stickers, mortisers, stabbers, relishers, and sanders, before being completed. Each operation in its turn requires care in machining and close inspection so that the various parts will go together properly.

The final operation is at the clamps where the window is put together and pinned with a metal dowel after which it is sanded and packed for warehousing and shipment.

In our sash operation we use two double end tenoners, one single end tenoner, five sash stickers, three chain mortisers, two stabbers, two relishers, one cleat machine, four clamps and three sanders.

The average production is about two hundred windows per hour, or an average yearly production of 500,000. During the twelve years' operation of this department they have produced some six million windows, which in actual lumber, not including waste, would amount to forty-five million feet.

The door department's average production is two hundred and fifty per hour or an average yearly production of 550,000 doors. During the thirteen years of the door operation this department had produced more than six and a half million doors, which required about one hundred and fifty million feet of cut stock.

Strict Attention to Shipping

Last but not least in the door and sash operation is the warehousing and loading. Considerable study has been given to this branch of the business as it is very important that doors arrive at final destination in first class condition. After giving every attention to manufacturing, careless loading may cause heavy losses after goods leave the plant.

Every car loaded is carefully inspected as to suitability for sash and door loading. Cars are swept clean and properly sawdusted.

To guard against nails and dirt, the doors are piled on two pieces of 2x4 the full length of the car. Each stack of doors has an end brace of 2x4s and the sides of the cars carry two pieces of the same material as protection against nails working out while car is in transit and thus damaging doors. All top doors on each stack are covered with red or grey resin paper as protection against dirt or cinders. The center or doorway of each car is braced sufficiently to stand the handling across the continent. Paper is nailed over the car doors on sides or ends of car to prevent dirt and cinders working through. With this done a car is ready for the market.

To Handle Hardwood Lumber Line

A. K. Johnson, of the wholesale lumber firm of J. P. Johnson & Sons, Toronto, who is well-known to the lumber and wood-working trade from several years' experience both in the yards and on the road, has been appointed Ontario representative of the Mowbray & Robinson Co., Inc., of Cincinnati, Ohio, manufacturers of hardwood lumber and flooring. The company specialize in oak, poplar, mahogany, beech, etc.

Mr. Johnson spent several days recently at the mills of the company familiarizing himself with their operations, and will call upon the lumber trade and wood-working industries of Ontario in their interests. He succeeds M. E. Cummings of Buffalo, as Canadian representative. J. J. Linehan of Cincinnati, sales manager of the company, was in Toronto recently, and

A. K. Johnson, Toronto, Canadian representative of Mowbray & Robinson Co., Inc., Cincinnati, Ohio.

met a number of members of the trade. Chas. Johnson, who is an uncle of A. K. Johnson and brother of J. P. Johnson, is manager of the company's interests in Rochester and surrounding territory. The appointment of A. K. Johnson should prove a popular and successful one for the Mowbray & Robinson Co., as he has many friends in the wood-using industry.

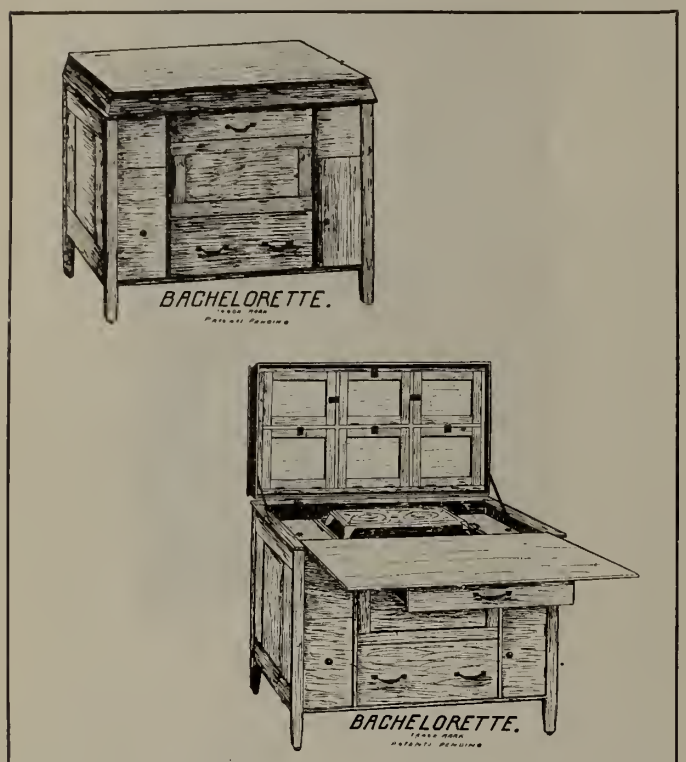
Mahogany Flooring Now on the Market

Mahogany flooring is a new commodity in this country. Undoubtedly the public will have to be educated to its use. It is now being marketed in the New York Metropolitan district by The Indiana Quartered Oak Company of Long Island City, large producers and importers of Philippine mahogany. Already several carloads of flooring cut from plain and quartered-sawed mahogany have been reported sold. This flooring is being worked from one-inch boards, thirty inches wide, being turned out in stock 13/16 x 2½ inches. It has been bringing $260 per thousand feet wholesale, a price which for some time was cheaper than quartered oak flooring, but the latter has dropped. The mahogany flooring is very attractive in appearance, and there are possibilities of its becoming a staple commodity in this market, particularly if other hardwoods hold up in price to any way near where they now are.

Combines Utility and Attractiveness

A new piece of furniture that attracted considerable attention and received much favorable comment at the Furniture Exhibition held in Toronto recently was the Bachelorette, as manufactured and exhibited by A. E. Guidal, Limited, Toronto.

The Bachelorette, which is covered by patents, is a combination china cabinet, kitchen cabinet, dining table and gas or electric stove. It is designed as an attractive piece of furniture, and when closed gives no hint of its great utility. Mr. Guidal, the inventor, who, needless to say, is a bachelor who batches, became tired of seeing his room strewn with pots, pans, dishes,



Guidal "Bachelorette" opened and closed

etc., and set himself to devise a camouflaged kitchen and china cabinet, which would take care of all cooking and eating paraphenalia, and which would not be an eyesore but would fit in with the furnishings of any room. The "Bachelorette" is the result.

A good idea of this article may be gained from the accompanying illustrations. When closed it might pass for a phonograph, sewing machine or some similar article. It is when opened that its utility is seen. The cover, which is fairly deep, is fitted up as a china cabinet, and provides space for the dishes required by six persons. It is fitted with ingenious holders and racks so that every square inch is utilized and the dishes are held securely, preventing breakage.

When the cover or lid proper is pulled out, which makes a table sufficiently large to seat four people, the gas plate or electric stove rises into position. At either end of the stove are two compartments with hinged lids, one of which is a bread or cake box, while the other is used for storing tea and coffee pots, saucepans, etc. The large drawer under the table top takes care of the silver, table linen, etc. At either end of the cabinet are two narrow deep drawers. One is fitted up to hold bottles of all kinds, salt, pepper, pickles, etc. The other small drawer is used for storing pots and pans. The large deep drawer in the centre of the cabinet takes care of the cereals, sugar, groceries, etc. Thus it would seem that nothing has been overlooked.

A clever attachment has been provided to close the gas as the table is pushed back in place. Thus if one were in a hurry and closed the cabinet, without turning out the flame, it would be done automatically.

There should be a strong demand for this handy piece of furniture. The appeal should not be confined to bachelors and girls who rent rooms or small apartments and prepare their own meals. With high rents and housing conditions as they are, it should appeal to families living in a few small rooms.

1921 to be Good Year

"A year ago I was considerably worried about the future, but I have no apprehensions at present," states W. Maxwell, Vice-president, Canadian Edison Phonographs, Limited, St. Thomas, Ont. "It seems to be very plain that 1921 is going to be a good year for every legitimate enterprise."

"It is natural for businessmen, who have gone through previous periods of business depression, to base their opinions on past experiences, and therefore many look for a gradual rather than a rapid recovery. In this situation past experience is not an altogether infallible guide, as we have a new kind of financial system, which, in view of the acute deflation of credit that has occurred, may contribute considerable resilience to the recovery of business. There is at present every indication that there will be a shortage of many kinds of merchandise, and there may very soon be quite a scramble among buyers and a different attitude on the part of the buying public. In certain lines of industry, it seems to me that the situation has been handled just about as badly as possible, and all branches of industry must, in some measure, pay the penalty. On the other hand, we shall all be benefitted when the deadlock is broken."

Newer Uses for Sawdust

Until quite recent times sawdust was regarded in wood mills as a waste product. Now it serves many purposes and has a commercial value of something like ten shillings a hundredweight, says Pearson's Weekly.

Sawdust is particularly useful in the manufacture of various building materials. Mixed with clay it makes splendid tiles and bricks, while combined with concrete an economical and good-wearing flooring material is obtained.

To French chemists belongs the discovery of sawdust dyes. They found that a combination of various chemicals acting upon sawdust produced a substance which is said to be quite as effective as the best aniline dyes for coloring purposes.

In Germany during the war a huge amount of sawdust was used for making bread. It was first treated with chemical agents to extract certain harmful ingredients, after which it was mixed with flour and baked in the usual manner.

Probably the most remarkable discovery of all is that a gas, excellent both for lighting and heating purposes, can be made from sawdust. From experiments that have been conducted in America it is believed that, particularly in the neighborhood of sawmills, the gas could be produced so cheaply as to be supplied for a few pence per thousand feet.

Gold Medal Celebrate 30th Birthday

The Gold Medal Furniture Manufacturing Co., Limited, Toronto, Uxbridge, Montreal and Winnipeg, recently celebrated its 30th birthday. This organization has enjoyed a steady and what to those interested, must be a very gratifying development. Starting in 1890 as the Gold Medal Spring Bed Co., a partnership

W. J. McMurty, president and general manager, Gold Medal Furniture Co., Limited, Toronto.

formed to manufacture spring beds, it was only a few years until both mattresses and upholstered furniture were added to the line. In 1899 the company was incorporated under the present name, The Gold Medal Furniture Mfg. Co., Limited, with a capital of $100,000, and W. J. McMurtry as president and general manager. Three years later, in 1903, the capital was increased to $250,000, and the present large factory erected in Toronto. In 1900 the Montreal branch was opened. Here the output was confined to springs and mattresses. The next development was the opening of a branch in Winnipeg, Man., in 1905. Like the Montreal factory springs and mattresses made up the line manufactured. The Uxbridge plant was acquired from the town of Uxbridge in 1912. This is an up-to-date woodworking factory and takes care of the woodworking requirements of the other branches. In addition to producing spring, chair, davenport and parlor suite frames for the various factories, a line of phonographs is being made and marketted at the Uxbridge plant.

The Montreal branch was reorganized in 1920 and incorporated as The Gold Medal Bedding Co., Limited. Paid-up capital $199,000. W. J. McMurtry is president and general manager of this company with W. R. Johnston, manager and vice-president.

The activities of the company are divided as follows: The Toronto plant is devoted to making upholstered furniture, springs and mattresses and also conducts a wholesale business in upholstering coverings and materials. The Uxbridge factory takes care of all the woodworking requirements of the other branches and turns out a complete line of phonographs. The Montreal and Winnipeg plants make a line of bedding, which includes springs, mattresses and steel frame couches. When conditions are normal, employment is provided, at the four factories, for about 350 men.

Managers and superintendents from Toronto, Montreal, Winnipeg and Uxbridge factories and over 15 of the firm's representatives from coast to coast assembled recently to inspect the Toronto and Uxbridge plants, and to discuss and map out a policy for 1921, in which service and honest workmanship was the keynote. All the members of the firm are justly proud of the enviable record which has been built up over a period of more than 30 years of aggressive manufacturing. The Gold Medal Furniture Co. has stood for all that is best in the industrial world and its success in the past will serve to inspire all to greater efforts in the future. Mr. McMurtry imbued all present with his dauntless Canadian spirit of cheerfulness and aggressiveness, and it is confidently expected that 1921 will mark another year of success for this progressive organization.

In the past two years three new officials have been added, W. R. Johnston of Montreal, formerly travelling representative for the firm; C. A. McMurtry and Bruce McMurtry. The personnel of the company is as follows: W. J. McMurtry, president and general manager; H. B. Shortt, secretary-treasurer, and George Hughes, W. R. Dalby and Claude A. McMurtry, directors.

With the progressive policy outlined at the conference and the perfecting of the organization through the addition of new members, it is fully expected that the business will be doubled in the next few years.

Edison on Eight Hour Day

On the occasion of his seventy-third birthday, Thomas A. Edison "consented" to take a half-day off from his work to permit his friends to celebrate the anniversary. On the subject of work and the eight-hour day, he said:

"I am not against the eight-hour day, or any other thing that protects labor from exploitation at the hands of ruthless employers, but it makes me sad to see young Americans shackle their ability by blindly conforming with rules which force the industrious man to keep in step with the shirker. I have always felt that one of the principal reasons for American progress in the past has been that every man had a chance to become whatever he wanted to be. It used to be fashionable to be ambitious. The employee planned to become an employer; the unskilled man sought to become skilfull. A young man was not well thought of if he were not striving for a higher place in life.

"Today, I am wondering what would have happened to me by now if fifty years ago some fluent talker had converted me to the theory of the eight-hour day and convinced me that it was not fair to my fellow-workers to put forth my best efforts in my work. I am glad that the eight-hour day had not been invented when I was a young man. If my life had been made up of eight-hour days I do not believe I could have accomplished a great deal. This country would not amount to as much as it does if the young men of fifty years ago had been afraid that they might earn more than they were paid. There ought to be some labor leader strong enough and wise enough to make trade unions a means of fitting their members for better jobs and greater responsibilities.'

Box Manufacturers Advertize Product

National Association of Box Manufacturers to Launch Extensive Publicity Campaign—Educate Consumer to Value of Wood Container—Offensive and Defensive Measures

By H. P. Howard*

Looking ahead from the height of prosperity in the spring of 1920 to the reaction which must sooner or later follow, the National Association of Box Manufacturers decided to undertake a co-operative trade extension programme to strengthen the wood box industry.

Preparations for this campaign were promptly begun, and we promptly encountered practical problems that had to be solved, and practical difficulties that had to be overcome. It was found that the usual method of employing an agency to handle the work was not practicable. The wood box is not so simple an affair as it looks, nor does it respond to ordinary advertising treatment. Unless the advertising writer is personally familiar with the many ins-and-outs of the wood-box industry, his copy is sure to be filled with technical and ethical errors which, while slight in the eyes of the average person, become absurdities to a box maker or a box user.

Scope of Publicity Campaign

In working out the general scheme of our advertising campaign, the general purpose develops three subdivisions: (1) Defensive measures, to modernize selling methods, offset activities of competing containers, show the superiority of the wood box and justify its cost, and develop containers using less wood. (2) Offensive measures, to develop cheaper packing methods, urge the use of wood boxes in lieu of other containers, and urge use of boxes for commodities now shipped in bulk. (3) Constructive measures, to standardize styles of boxes, create a demand for better boxes, co-operate with carriers to develop satisfactory shipping containers, co-operate with box users to meet their special needs.

In working out the programme, we have developed two lines of advertising. First, we help the individual manufacturer by designing and supplying advertising matter to be used by himself. The matter used is in the form of blotters, leaflets and enclosures, each conveying a single good selling idea, expressed in a few clear words, printed in readable type, and simply illustrated. A touch of good humor is added, and the whole is presented in compact and attractive form. The matter is furnished by the association to its members, who send it out by mail direct to those whom it is desired to reach. This method is both effective and economical. There is no waste circulation. Each message gets to the right man, and is likely to be read by him.

To Aid Members in Every Way

As was to be expected in a co-operative campaign, in which each member must help himself, there arose practical problems to be solved. Many members had never advertised by mail before, and they had to compile their mailing lists before they could determine to whom they wanted to send advertising matter and what quantity was needed.

To aid in this work, the association prepared and issued a pamphlet on "How to Compile Your Mailing List." Suggestions to aid the individual member in using the advertising matter were given in another concise pamphlet called "Create Good Will and Increase Your Sales." These have proven valuable aids, and the use of direct-by-mail advertising is now a settled policy among many members of the association.

The small amount of time and labor expended in this work by the individual member is a good investment, since it has given him a new hold on his own business and on his customers. More than that, it has reminded him of many former cutsomers, whom he had forgotten or neglected. Still more, it has stirred him to look around for possible new customers, especially among those who have been using other kinds of containers.

Work Getting Under Way

The secretary and his assistants helped the individual members to get under way, and this campaign was fairly launched in November, with matter which was sent out by individual members for December. After two months the progress made and the interest taken by members has been excellent. Results cannot be fairly estimated until the campaign has had a long test by steady, continued and concerted use.

Following the campaign to help the individual manufacturer, the National association is now about to launch a general advertising campaign on behalf of the industry as a whole, thereby also helping the individual manufacturer. This is true co-operation in its best sense.

General Publicity Work

The general advertising campaign will reach the most important lines of industry which use, or which should use, the wooden box as a container. Boots and shoes, canned goods, textiles, fruits, confectionery, and almost all the products of mill, factory, shop and dairy can be shipped to advantage in wood boxes. This is being suggested and urged through readable articles on the subject of boxes, their manufacture and uses all over the world. Some paid illustrated advertisements are being placed in the most widely circulated trade journals in the largest box-using industries. These advertisements and their illustrations are of striking quality, and will attract much attention. This part of the campaign is now under way, and promises to be a success.

Copies of illustrated advertisements will be furnished to members, to be distributed by them in their individual advertising campaign, thus linking the general advertising to the individual advertising, and making each support the other.

The development of our advertising campaign has taken much more time and labor than was anticipated at the beginning, which seems to be the common experience of those who have undertaken an advertising campaign. After going through the necessary period of organization and development, we believe that we have at last succeeded in producing a quality of advertising that will be a decided help to the wood box industry.

*Ass't. Secy. National Association of Box Manufacturers.

How Do You Figure Feetage in Box?

Uniform Methods of Calculating Lumber in Box Tends for Greater Accuracy and Eliminates Guesswork—Method Adopted by Many Box Manufacturers

By L. J. Conway*

No doubt many box users wonder at the wide variation in quotations received when a number of box makers figure on their requirements. This is due, partly at least, to different methods of figuring and apportioning costs. Primarily it is essential that the number of feet of material be accurately figured out, making due allowance for all waste, overlapping, extensions, etc. It is here where many box manufacturers fall down. They do not use any uniform method of calculating the feetage in a box and fail to make sufficient allowance for extensions.

In our estimating we have adopted Leaver's Estimator as standard, and work on the following rules:

1. A scale of additions to cover the extension or overlapping of different parts of a box, includin the cleats. This scale should be used uniformly all through the process of figuring.
2. The following schedule to cover the additions for every extension, these additions depending on the lumber used;

For two extensions over any	¼ in.	thickness add	½ in.
For two extensions over any	5/16 in.	thickness add	¾ in.
For two extensions over any	⅜ in.	thickness add	¾ in.
For two extensions over any	7/16 in.	thickness add	1 in.
For two extensions over any	½ in	thickness add	1 in.
For two extensions over any	9/16 in.	thickness add	1¼ in.
For two extensions over any	⅝ in.	thickness add	1¼ in.
For two extensions over any	11/16 in.	thickness add	1½ in.
For two extensions over any	13/16 in.	thickness add	1¾ in.
For two extensions over any	⅞ in.	thickness add	1¾ in.

3. Lay out your boxes into so many definite parts. The use of a diagram, as shown in the accompanying illustration with which to make your layout, is suggested.
4. Figure all Boxes net and on the Actual inside measure.—Example: A box 11½ wide inside measure with sides of ⅜ thickness figure the top 12¼ wide.
5. Figure only on the ¼ fractions. Example a box 5⅝ deep, figure the sides as 5¾ in. wide; in other words, change dimensions ending in 1/16 or ⅛ to the next ¼ fraction.
6. In making out your lay-out, remember the following: (1) add to the width of the top and bottom for the extension over sides Example: box inside measure 11/12 in. wide, sides ⅜ in. Figure top 12¼ in. wide.

   (2) Add to length of sides, top and bottom, for the extension in length over ends, as in style No. 1. Example: a box inside length 19⅝ in. with ends 13/16 in. thick, Add 1¾ for ends. Figure length of top or bottom as 21½ in. long (not 21⅜).

   (3) Add to the length of sides for extensions over ends and cleats as in style No. 4. Example: Inside length 19⅝ in., ends 13/16 in., cleats ⅜ in., add 1¾ for ends: add ¼ in. for cleats.

   This gives you 22⅛. Figure length of sides 22¼ in. Top and bottom, 21½ in., length over cleats and ends as in styles No. 2, 2½ and 3. Example: inside length 24⅝ in., ends ½ full; cleats ⅝in.; Add 1 in. for ends, and ¼ in. for

*Manager, Canada Lumber & Box Co., Quebec.

NAME _____ DATE _____

NUMBER OF FEET IN BOX REDUCED TO INCH MEASURE

INSIDE MEASURE OF BOX

STYLE	NO.	LONG	WIDE	DEEP	THICK	CLEATED	MATCHED

NO. PIECES

OUTSIDE MEASURE OF PIECES FOR BOX

	LONG	WIDE	THICK	TOTAL INCHES
SIDES				
TOP BOTTOM				
ENDS				
CLEATS				
CLEATS				

FEET IN BOX

Space for figuring

Convenient form for computing lumber contents of box.

cleats. This gives you 26⅞ in. Figure length of sides, top and bottom 27 in.

7. To figure uniformity the thickness of sawn lumber, the following method should be used in order to arrive at a basis for securing uniform feetage. Box parts made from:—

3/16	rough	Figure	3 pieces from 4/4
3/16	D-I-S	Figure	3 pieces from 4/4
¼	rough	Figure	3 pieces from 4/4
¼	D-I-S	Figure	3 pieces from 4/4
5/16	rough	Figure	3 pieces from 5/4
5/16	D-I-S	Figure	3 pieces from 5/4
⅜	rough	Figure	2 pieces from 4/4
⅜	D-I-S	Figure	2 pieces from 4/4
7/16	rough	Figure	2 pieces from 4/4
7/16	D-I-S	Figure	2 pieces from 4/4
½	rough	Figure	2 pieces from 5/4
½	D-I-S	Figure	2 pieces from 5/4
9/16	rough	Figure	2 pieces from 5/4
9/16	D-I-S	Figure	2 pieces from 5/4
⅝	rough	Figure	2 pieces from 6/4
⅝	D-I-S	Figure	2 pieces from 6/4
11/16	rough	Figure	2 pieces from 6/4
11/16	D-I-S	Figure	2 pieces from 7/4
¾	rough	Figure	2 pieces from 7/4
¾	D-I-S	Figure	2 pieces from 7/4
13/16	rough	Figure	1 piece from 4/4
13/16	D-I-S	Figure	1 piece from 4/4
13/16	D-2-S	Figure	1 piece from 4/4
⅞	rough	Figure	1 piece from 4/4
⅞	D-I-S	Figure	1 piece from 4/4
⅞	D-2-S	Figure	1 piece from 4/4
15/16	rough	Figure	1 piece from 4/4
15/16	D-I-S	Figure	1 piece from 4/4
4/4	rough	Figure	1 piece from 4/4
4/4	D-I-S	Figure	1 piece from 5/4

These are commercial or merchantable thickness with a reasonable variation permitted.

8. If full thickness without variation is required, then use next greater thickness for your basis of figuring.

B. If shook stock is to be dressed two sides and full thickness also, use next thickness of lumber except where specified in above list.

C. Veneers and Rotary cut lumber to be figured surface measure. A box constructed of a combination of lumber and veneer, each product should be figured as referred to above.

9. Crates and crating.
(1) Figure only on the ¼ fractions.
(2) For crating required full width, add ¼ in. to the actual width (figuring on ¼ in. only). Example: (a) Crating strips, 1¾ in. full figure 2 in. wide; (b) crating strips full ⅞ in. or 15/16 in. figure as 2¼ wide.
(3) Crating in fractional lengths figure length on the next ¼ in. as in shooks.

10. Lock corner and dovetailed boxes.
(a) Use the next thickness of lumber shown in above table for your bas's if stock is D2S.
(b) Add ¼ in. to length of ends and sides on account of extra projections of the tenons for lock corner or dovetailed boxes sold in the shook. Bottle boxes and standard boxes.

Courses in Boxing and Crating

Special courses on boxing and crating are to be given at the Forests Products Laboratory, Madison, Wis., as follows: January 10 to 15, 1921; March 7 to 12, 1921; May 2 to 7, 1921.

The object of this course is to demonstrate for manufacturers and packers the principles that underlie proper box and crate constitution and to develop economical containers that will deliver the contents in a satisfactory condition at a minimum cost.

There is a daily loss to shippers and manufacturers, conservatively estimated at $500,000, due to poor packing and to expensive and improperly designed containers for all classes of domestic and foreign shipments. During the year 1919, Class 1 railroads alone expended $103,078,862 for lost and damaged freight, and in July of the same year the western inspection bureau in 12 cities refused or repaired 43,738 packages.

The Laboratory has co-operated with associations and companies in improving the packing of widely varying types of commidities, such as electric lamps, cream separators, automobile parts, small tractors, talking machines, boiler castings, furniture, paints and oils, piano benches, fruit baskets and crates, and shoes. These tests and studies, in many cases, resulted in the redesign of the container. The new design gave increased strength and often decreased the amount of material used in its manufacture; gave security against pilfering; decreased the cubic contents; reduced labor and cost of manufacture; made possible more rapid production of packages; decreased cost of ocean freight; and permitted improved method of handling freight. This work is of value to all manufacturers, shippers, and dealers, and to the public at large, which is vitally concerned in receiving its necessary commodities in satisfactory and economical containers.

The course lasts 5½ working days. Reference material and condensed notes are given out, and it is necessary for those attending to devote a portion of each evening to study.

Only twelve men are accepted in a class. This makes possible the exchange of ideas and experiences with men from different organizations and the research men of the Laboratory. A series of supper discussions lasting about an hour, give further opportunity for friendly exchange of ideas. One subject is studied each day, and the day's work is completed with an oral or written review.

Monday.—Registration. "What did you come to get?" Tour of Forests Products Laboratory.

Drop tests to demonstrate characteristic failures of different types of boxes. Informal supper at 6.30 p.m.

Tuesday.—Drum tests to demonstrate the necessity of adequate nailing. Demonstration to show effect of varying number of pieces on sides and ends.

Wednesday.—Relative holding power of different kinds of nails. Effect of using green lumber for boxes. Tension tests.

Informal supper at 6.30 p.m.

Thursday.—Strapping, methods of application and efficiency. Influence of grade of lumber and location of defects on boxes and crates. Crate construction and tests. Drum tests.

Friday.—Solid and corrugated fiber board and wire-bound boxes. Identification of box woods.

Informal supper 6.30 p.m.

Saturday.—Source of supply and characteristics of box woods. Final questionnaire—"Did you get what you came for?" Final conferences.

A co-operative fee of $100, payable to the Forest Products Laboratory, is charged partially to cover the cost of conducting the course. This fee does not include travelling and living expenses.

Machinery & Equipment

Efficient Motor Driven Band Saw

One of the types of band saws manufactured by the West Side Iron Works, Chicago, Ill., is shown in the accompanying illustration. This is made either for belt or motor drive. If motor driven, the motor is mounted within the frame, on the shaft of the lower wheel. The bearings are long and large. The lower bearing rests on the main frame and has a bearing, 14" long, also a 5½" outboard bearing outside the pulleys. The top bearing is 14" long. The main frame is designed to support this bearing providing a planed surface 6½" wide. The wheel rims are of forged steel, turned and ground accurately and then assembled on a balanced hub by means of steel spokes. The wheels are trued up three times before the rubber bands are vulcanized on, after which another grinding and truing operation takes place. The table, which is 30" x 38", is supported within double circle castings. It will tilt 45° to the right and 5° to the left. All adjustments are made from the operator's side of the table. A speed of 500 R.P.M. is recommended for the plain bearings, while the motor driven type is run at 600. Circulars and full information may be had from the manufacturers.

Motor driven, ball-bearing saw

"Imperial" Thicknessing and Moulding Machine

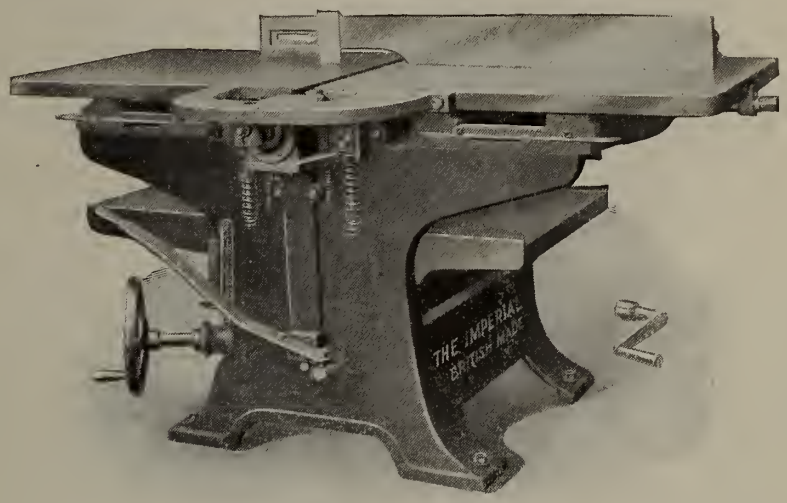
Information has been received from England relating to an interesting development in the manufacture of woodworking machinery.

The Hollis Wood Trimmer Company, of Wylde Green, Birmingham, England have undertaken the manufacture, on quantity production lines, of a number of machines heavily in demand in the British market. The principle which has been adopted is to manufacture as far as possible one machine in each works. The machines which are already under manufacture include spindle moulders, combined planers and thicknessers, circular saw benches, scroll saws, pattern makers lathes and smaller machines.

One of the machines produced under these conditions is depicted in the accompanying illustration. This is a Hand and Power Feed Planing, Thicknessing and Moulding Machine. It will perform surfacing taper and straight and to any width or thickness, jointing, chamfering, bevelling, cornering rebating, thicknessing — boards and panels, squaring up, planing to any angles to the side, tongueing and grooving.

The gear and driving pulleys are arranged at the back of the machine and since the operator stands at the front when working he is clear of all danger and able to obtain the maximum output. In addition, the gears are carefully covered with a cast iron guard, so that the safety of the operator is attended to in the fullest degree.

The machine is of the ball bearing type and indicative of the refinements which are included, is the index, which indicates the depth of timber being thicknessed, many woodworkers are now called upon to carry work out in the metric system. It is made in two sizes, the smaller size planing 15" wide and thicknessing up to 6", the length of the table top being 4' 8". The larger size planes 20" wide by 8" thick and has a length of table top 6'.



Combination planer and jointer.

Motor Driven Variety Saw

The illustration shows the "Lightning" 500 Direct Motor Driven Variety Saw for use in furniture factories, woodworking plants, box factories and variety shops or wherever a medium weight, wide range saw is required. This is one of the newer development in the saw line for variety cutting, grooving, gaining, etc. and the construction is such that all the adjustments can be made very quickly.

Saw blade runs in a cast iron chute with removable cover and is equipped with an aluminum guard above—no chance whatever for an accident. The

chute also removes the saw dust either to an exhaust or to a box if there is no exhaust.

Table is 36 x 42" and is a heavy, ribbed casting mounted on machine segments. It angles up to 45 degrees by hand-wheel and screw. A brass index plate shows the exact angle and the table has a vertical adjustment of 5". Both adjustments are self-locking in any position. There is no back-breaking

"Lightning", No. 500

strain required to raise table—the ball bearings on raising screw making it very easy.

With the 14" blade this saw will rip stock up to 3" thick, 17½" to right and 16" to left or will cut-off stock up to 1" thick and 18" wide. This saw is also equipped with a hollow chisel mortising and boring attachment and the mortiser can be used while the saw is in use without any interference. It mortises rapidly and accurately without pounding or jarring, making a perfect mortise with square corners and sharp edges. Uses mortise chisels from ¼" to ¾", any length of mortise and up to 3" deep.

Full particulars may be secured from the manufacturers, Messrs. J. A. Fay & Egan Co., Cincinnati, O.

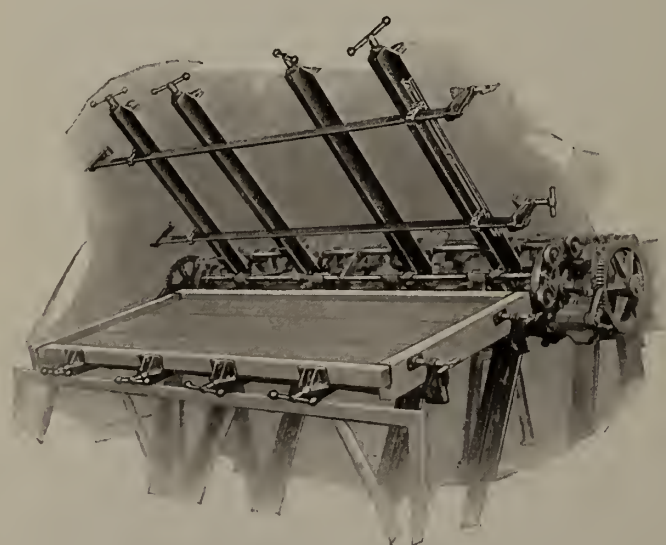
Wood Brick From Mill Waste

After five years of surmounting obstacles, J. Wade Tucker, one of the most prominent lumber operators in the South, has completed his wood-tex brick, a brick in which he utilizes the waste material, such as sawdust, at his big cypress mills at Loughman and elsewhere. The brick is 2½ x 5 x 12 inches, which is larger than the vitrified brick used for paving, and it weighs six pounds less than other paving brick. It is considered indestructible, which eliminates loss from chipping. The extra size and lightness will, it is figured, reduce cost of laying. The plant at Kissimmee, Fla., opened last week and has a capacity now of 10,000 brick daily.

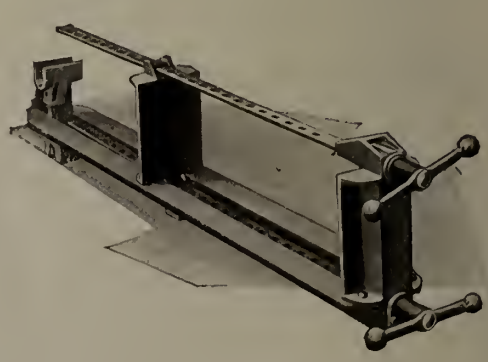
End Veneering Clamps

The end clamping device for clamp carriers, shown in the accompanying illustration, was originally designed at the request of piano manufacturers. The first design was one in which the clamps were stationary and after putting this in use it was found it would be more desirable if an arrangement could be made whereby the end clamps would be adjustable to any position desired on the carrier clamps. It was also found desirable to have these carrier clamps take up as little space as possible so as to provide for stock at least 2¼" thick. The device shown is the outcome. It has been used by a number of leading manufacturers during the past 6 months and they report it very satisfactory. It could also be used for framing doors, panels and various kinds of other work in addition to end veneering, and as a most valuable adjunct to the clamp carrier. The end clamps are always in place ready for use, yet they are not in the way when doing plain joint gluing.

The other illustration depicts a clamp on which stock up to 6½" thick can be glued. These can be furnished on all Taylor clamp carriers and revolving clamps. It is the same general design as regular carrier clamp but has jaws over 6½" high and provides a draw bar screw on top of the work. For further information write the James L. Taylor Manufacturing Co., Poughkeepsie, N.Y., or the A. R. Williams Machinery Co., Toronto.



End veneering attachment



Clamp for thick stock

ATTACHMENTS FOR TAYLOR REVOLVING CLAMP

Upholstering and Trimming

Woven Fibre in Furniture of To-day

New Product Finding Its Way Into Many Furniture Factories—Comes in Rolls of Various Widths Ready for Applying

By Paul R. Hawn

For years, the imports of reed have increased with the constantly growing demand for more and greater production of all kinds of furniture. While the supply was not always hard to get, shipping conditions were such that the genuine imported reed could only be bought at a premium. A few of the more farseeing manufacturers had anticipated some such situation, and had carried on extensive experiments with a fibre produced in this country. While the business was yet in its infancy, comparatively speaking, the war broke out, and what was formerly only an aggravating condition, to be borne in the best humor possible, became a vital threat, to be met and overcome.

Then it was that woven fibre first began to appear. At first, it was looked upon in doubt, and was declared by many to be another impractical experiment which would not "take" with the general buying public. One manufacturer, with both faith and confidence in his own judgment, put out a line of "fibre furniture." The results were watched with intense interest by the trade in general, and particularly by other manufacturers in the same predicament, but who had lacked the necessary essentials to put across something new. Its reception was such a victory for the product, and a vindication of good judgment, that its use sprung into favor with manufacturers from coast to coast.

Because of its great demand, and the many shapes and sizes in which it was prepared, to suit the individual ideas of various manufacturers, the fibre was, for a long time, supplied in the raw form, being woven by hand by the manufacturer himself. To do this, another serious problem had to be met and overcome. The reed worker had been using the genuine imported reed for so long that he had become wedded to the idea that nothing else could take its place. When the added pliability or flexibility of hard fibre as compared with genuine reed, was proved by actual test; when its freedom from cracking and splintering was clearly demonstrated; when the increased amount of finished work per day was clearly shown, because of the features mentioned above, to say nothing whatever of the advantage to the worker, personally (who no longer went home at the end of a day's work with his hands blood raw from the constant stripping and handling of the material), it was firmly established with the manufacturer. Particularly so when it was shown that the per pound price, taking into consideration the question of yardage, was fully 25% less.

It was inevitable that sooner or later many further developments should be made, and that the round fibre should finally be woven by machines. The loom manufacturers contended that it could not be done with a shuttle loom, but as is oftentimes the case, the old adage, "Where there's a Will, there's a way", proved true in actual practice. Today this is being successfully accomplished, to the benefit of the general manufacturing trade, and to the ultimate benefit of the consumer.

The material is woven in rolls of various widths, given the selvage on both edges. Production costs have been cut to a minimum by using the machine woven material. Usually it is installed in a single piece for the back and sides of a chair with another sheet for the seat. The un-woven hard fibre is used for winding on the legs and in such parts of the frame as are left visible. The fact that the size of both the un-woven and consequently the woven material can be varied from about .1/16" to 5/32" in diameter, also makes for an added attraction in that a greater choice is afforded the manufacturer for his line, and the consumer, according to his or her tastes.

To say that the full scope in the use of woven hard fibre has been reached, or to say that the limit has been reached in the manufacture of woven hard fibre itself, would be as foolhardy as for one to declare that electricity has reached its limit. As in the beginning necessity was the "mother" of the invention, so may the need arise later for further developments, or other changes in the form of the material. Just what the next step will be, no one can clearly foretell, but that resourcefulness accepts no limit is a truth not to be doubted in view of past proofs to the contrary.

Montreal Upholsterers Form Association

One of the newer association to be formed in Canada is the Montreal Upholstered Manufacturers' Association. This association was organized during the latter part of December. Up to its formation the upholstered furniture industry in Montreal was in a more or less demoralized state. A number of small men were enabled to start manufacturing upholstered lines, through the assistance of certain retailers, and in consequence prices were cut and the confidence of the furniture trade undermined. The new association embraces practically all upholsterers, both large and small, and it is felt that through the co-operation made possible by such an organization and through the mutual confidence, which will be established, the industry in Montreal will be placed on a much more stable basis. The effect of this complete understanding will be felt not only in Montreal and vicinity, but throughout the whole furniture industry.

A large furniture factory in the States has a moving stairway to carry furniture from one floor to the other.

A foreman who studies the trade papers is a more useful man to have about a plant than one who could give you a tip about a possible loser.

How We Can Secure Industrial Stability

The Seven Instincts of Man—More Attention to Industrial Stability—Self Expression a Prime Factor

By D. D. Fennell*

(Continued from December issue)

It must be admitted that organized labor with its limited vision, its restrictions, limitations and rules, never was and never will be as efficient as unorganized labor. To-day I am an advocate of the open shop, not because of what it accomplishes by way of better production for the employer alone, but because of the opportunity it affords the employee for progress and advancement. Organized labor as at present organized and led will never be a contributing factor to the attainment of a more stable condition in industry.

What part has so-called industrial democracy played in stabilizing industry? We must first determine what we mean by industrial democracy. John Leitch has a plan which has been marked by both success and failure in its installation. This is committee representation through a house of representatives and a senate of employees. W. L. Stoddard developed for the War Labor Board a shop committee plan, which has been intermittently successful and represents a conservative and efficient type of industrial democracy plan. But the term "industrial democracy" is a very inclusive one. It comprehends necessarily every phase of the movement in industry which is in opposition to autocracy and paternalism., The co-operative societies of England have a part in this movement.. In England to-day there are 1,500 co-operative societies organized and controlled by workers. They have $350,000,000 of share capital. They do a billion dollars worth of business annually; own 12,000 acres of farm land. They own great steamships going to Denmark, Holland and various other places, and they own great tea plantations in Ceylon, cotton plantations in India and many factories manufacturing clothing essentials. Here is a movement in England representing 500,000 men with a capital of 350,000,000 doing a billion dollars worth of business a year, and their plan is a serious threat to the plan of manufacturing and merchandising as generally established. This organization has been in existence since 1844, starting with a membership made up of 26 weavers, but has made its most rapid growth in recent years.

The threat of this movement and its possible misdirection lies in its recent alliance with the labor union movement of England. This plan of manufacturing and merchandising will never be constructive of industrial stability, because of its alliances and the world-old failures of communistic and co-operative experiments. It has certain inherent drawbacks which will limit the scope of its operations.

According to Prof. Irving Fisher, there are seven major instincts in man: Self-preservation, self-expression or workmanship, self-respect, loyalty, love of home-making, worship and play. For purposes of analysis this outline is reasonably comprehensive.

Now stability for present purposes in industry can only be accomplished when we recognize that anything which affects any man employer or employee, in any department of human life, affects all. The interdependence and inter-relationship of mankind are such that there is hardly a plan put to work in a division of industry which does not directly or indirectly influence the lives of every man, woman and child in the world.

Production in industry depends on the will of the worker. The scientific psychologists tell us it is impossible to isolate the "will." There is no such thing as a "will" apart from character. Any legitimate psychologist will protest, with a great deal of feeling, against the schools that are to-day giving courses of instruction in "will development." Will is human character in action. Will is the expression of a man's life, revealed to the world in his personality.

Men are ruled more by their beliefs than by laws. While we are treating of production as a means of engaging man's thought and man's physical ability, gentlemen, we should appreciate the fact that men are influenced more by their beliefs than by law, more by their concept of the law than by the law itself.

Several years ago I was engaged as a consultant in a big power plant. We were endeavoring to cut down the cost of operation. I took over the buying, which had not been well done after I determined such items as packing, piping, steam specialties and coal were all purchased at too high prices. We found that by changing our source of supply on the one item of packing we could cut down the cost considerably. When the new packing came and was handed to the engineers and the firemen to put into the pumps and engines, they refused to use it. We asked that the new brand be used for a little while to determine its quality. They put it in and reported that the brand was of poor quality, so the chief engineer tried a little experiment. He put the new packing in some boxes with the labels of the kind of packing the men liked and gave it to them. The engineers at once told us how much better that packing was than the poor stuff they had been using. Men are influenced by their beliefs—what men believe to be right, what they believe to be their duty and what they believe to be their productive ability We must direct belief and will so there is a "will" to accomplish in our employees rather than a "won't" or wish not to accomplish.

Instinct of Self-preservation.

Self-preservation is a major instinct. Why do men work at all? You know the fear of hunger is very close to the heart of every man. It matters not how big a man's job, unless he has set aside through thrift and careful savings a certain amount to protect himself, there is always the thought that the wolf is at the door. It is as inherent in man as the desire to eat and drink.

I recall seeing the other day a most interesting thing as I was coming north from Indianapolis on the train. It was a hot day and the sun was shining down mercilessly on the fields. Under a small tree there were, perhaps, twenty-five horses forming a circle with their noses together and their heels out. Ten of the twenty-five were under the tree and fifteen were outside in the sun. There was room enough for all the horses in the shade, but moved by the instinct to protect themselves they stood with their heels out and their noses together ready to repel any attack which

*Director Industrial Relations National Association of Upholstered Furniture Manufacturers

was more important to them than getting under cover of the tree. These peculiar tendencies and instincts of past modes of living come back to men also. Always there is that fear in man that he or his family may go hungry, and that is why men work.

It is with constituted leadership in industry in co-operation with the employee that the building up of progressive constructive beliefs must lie. Only as the employer develops unshaken confidence on the part of the employee in his integrity and spirit of fair play can anything like stable conditions be established.

Self-expression of Workman

Self-expression or workmanship is a major instinct in man. If any of you gentlemen heard or read the address which I delivered in West Baden, you will recall that I stressed on that occasion, and I have always done so, the fact that the passion for self-expression is a basic one with men.

Away back in the geological age, before there was any organic life to be found, there was a spirit in the rocks which called for the existence of organic life that was so dominating and strong that there appeared on the earth lower vegetable forms, as well as protoplasmic animal forms, a jelly-fish sort of life that was the initial form of organic life. In that formless organism was the insistent desire for vertebra and brain which found its answer in a higher form of life. This tremendous urge pushing life higher and higher bore a wonderful fruit when man was born. This urge or instinct of self-expression crowned its determinative effort with the dawning of the human mind when man became a mental animal, which he is primarily. When one considers what this instinct for self-expression has accomplished—the inventions, explorations, researches in all the various fields; the rise to leadership of a Lincoln or an Edison, he is led to question if the instinct of self-expression is not more insistent than the instinct of self-preservation.

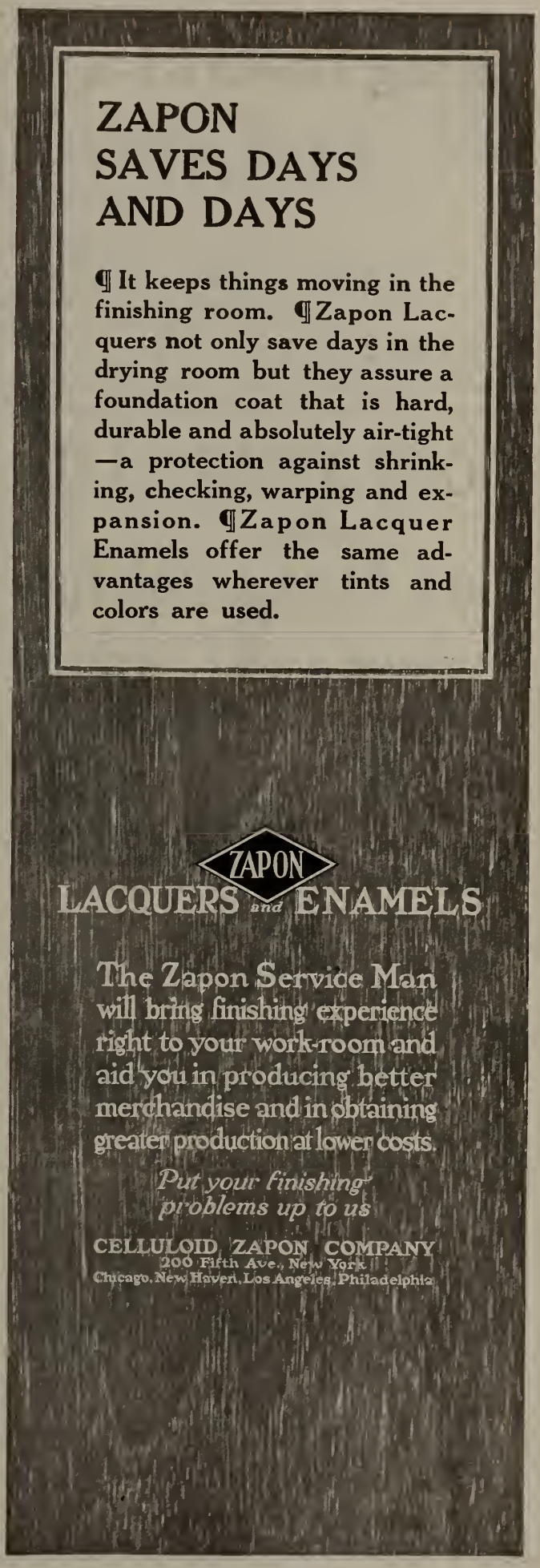
A totally ambitionless employee is an anomaly.

The young man in industry has ambition, and is a mental animal who will not be denied his privilege of exercising it. You cannot dam up the water of a man's purpose to a progress. If you do, it means destruction. Any false movement on the part of employers that will restrict the progress of employees will bring about disaster and incalculable waste

(To be concluded)

An Upholstered Phonograph

Heretofore the manufacture of phonographs has been confined largely to case-goods manufacturers, cabinetmakers and general woodworkers, but now we find an aggressive upholsterer placing what he calls the "Davenola" on the market. This consists of a large comfortable chesterfield of the usual style, with the exception of the arms, which are low, wide and flat, in one arm is placed a phonograph with horn underneath, operated by an electric motor. The horn opening is hidden by a small covered door, which is not noticeable when closed. To operate the phonograph the top of the arm, which is hinged, is raised, exposing the turn-table, controls, etc., and the drop-door, covering the horn is swung open. The other arm is constructed with hinged top or cover and is fitted up as a record case. The chesterfield itself is of the usual stuff-over type, deep upholstered, and may be had in the usual run of coverings.



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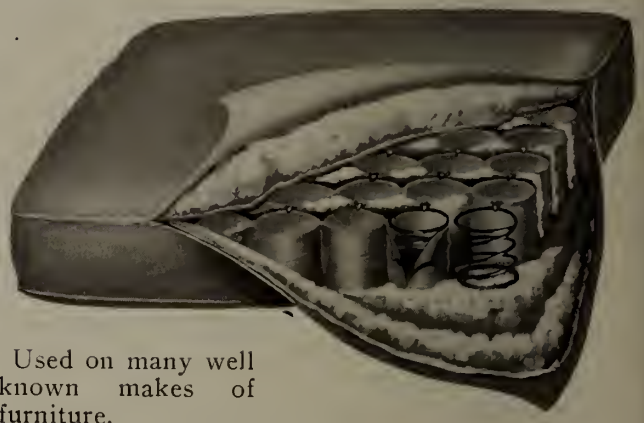

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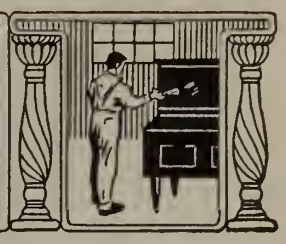

The Rapid Drying of Varnish

C. A. Cutler Presents Some Interesting Information Pertaining to the Drying of Varnish — How Varnish Hardens — Outlines Controlling Factors

By C. A. Cutler*

The complete chemical action which takes place as varnish hardens is not known, but the principal actions are known and probably would be interesting to varnish users. Varnish is made of vegetable gums, drying oils and evaporating thinners. There are, of course, many kinds of gums used and also many kinds of oils and thinners. The various combinations of these different materials and in varying relative quantities, go to make up the many different kinds of varnishes which naturally have somewhat different drying characteristics, but the hardening process is always the same,—first, evaporation of the thinners and then oxidation of the oils.

The thinners such as turpentine and naphtha are put into varnish principally because that mixture of gum and oil which would make a suitable varnish would be too thick and viscous to flow out evenly. There is also a claim that turpentine has some beneficial effect on the hardening or oxidation of the oil. Of any varnish, approximately 55% is evaporating thinners. These thinners must be a material that will volatilize quickly and at low temperatures. They should evaporate and leave no residue.

After the evaporation of the thinners has become nearly complete and the fumes have been carried away or at least well mixed with fresh air, then the oxidization process begins. There is left in the varnish just the oils and the gums. The harder grades of gums would harden at any temperature below 200 degress Fahr. but are held in liquid condition by the oils, so that the only problem after the thinners are removed is to harden the oil.

How Oils are Eliminated

The oils used are called drying oils in distinction from other oils, like olive oil for instance, which does not dry. The drying of an oil is a chemical process in which the oil gradually changes into what are called glycerides and fatty acids. There is an absorption of oxygen from the air by the oil and a further evaporation of the fatty acids. The oil will actually increase in weight by reason of the oxygen absorbed. The speed of this process depends upon the condition of the air surrounding the varnish and the driers which are put into the oils before it is put into the varnish.

Certain chemicals have the property of increasing the speed of oxygen absorption and are called catalysers. A very small percentage of one of these driers is introduced into the oil under conditions which are largely the secrets of the varnish making business.

*President Cutler Desk Co., Buffalo Manufacturers Cutter Dry Kilns.

In general, the lasting quality of a varnish is dependent upon the kind of gum used and upon the relative quantity and grade of oil used in the making of the varnish. It is also generally true that the drying time increases with each additional amount of oil. The value of a quick drying and at the same time a long life varnish are so obvious that we need not discuss that point except to say that this is what all varnish makers are striving to make.

Controlling Factor in Drying

Having a given varnish, the time required to harden is dependent upon the air conditions surrounding the varnish and into which it must throw the turpentine or naphtha fumes and from which it must receive the supply of oxygen to oxidize the oil to the degree of hardness required.

Evaporation of the thinners will be much faster in warm air than in cold air. Therefore, it follows that at least for the evaporation process much time could be saved if the coat of varnish was heated to the highest temperature that the varnish, or the material upon which the varnish was spread, would stand without injury. In making varnish the gums are heated to as high as 700 degrees Fahr. and the oil to somewhere around 300 degrees so that in most cases the determining factor as to the degree of heat that could be used, would be the material upon which the varnish was spread. In other words, a temperature of 250 degrees might not be harmful to the varnish, but it certainly would be to a piece of wooden furniture, and so the varnish itself is seldom the determining factor. The effect of heat on varnish has been discussed so far as evaporation is concerned but how does heat effect the process of oxidization?

Heat Assists in Work

The breakdown of the oils into glycerides and fatty acids is greatly accelerated by heat. The transformation of the fatty acids into fumes is also speeded up by heat. Therefore, heat will shorten the time required to get the oil into condition where it begins to absorb oxygen, which is the principal hardening process. Although varnishes are sometimes described as drying from the bottom upwards this is nevertheless distinctly untrue. It hardens by the absorption of oxygen from the air and obviously the air can be in contact only with the outside surface of the coat, so it must dry from the face inward. If the drying conditions are such that the top and bottom of the coat are in exactly the same condition as to temperature and evaporation, then the hardening will proceed evenly. But let us suppose that a freshly varnished piece was put directly into a temperature of 140 degrees Fahr. and let us suppose that the piece was a wooden table top 1½" thick. If the coating is heavy the varnish next to the wood will remain the temperature of the wood much longer than the surface of the coat which is in contact with the heated air. The surface would be in a hardening condition before the bottom of the coat had started and the

result would be what is called "skin-dried" or "case-hardened." The surface, in drying becomes more dense and delays the fumes of thinners and fatty acids from underneath and also the oxygen from getting into the underpart of the coat. Of course, there are some kinds of varnishes that are so long in oil or so slow drying that the temperature and condition of the bottom and top of the coat would be alike long before the surface had hardened enough to make any difference, but varnishes of this type are seldom used. If the varnish had been spread upon thin metal instead of thick wood, the bottom of the coat would have been heated nearly as quick as the surface and therefore, the danger of skin drying is very much less than would have been the case with a non-conductor of heat, like wood.

Thickness of Coat a Factor

The difficulty of uneven drying of varnish increases with the thickness of the coat. What is generally called a "standing coat" is less subject to skin drying because the varnish must necessarily be put on in a thin coat to prevent "sagging" when the piece is in a vertical position. Tops and horizontal surfaces require a better finish than other parts because they are most conspicuous and because they are seen with a more or less side light which exaggerates any slight defect in the surface of the varnish. These parts are given a "setting coat" and are dried in a horizontal position. There being no chance for sagging and a necessity for as nearly as possible a perfect surface, a very heavy coat of varnish is applied and the danger of skin drying increased with the thickness of the coating. Saddle seats of chairs for instance, require a very nearly perfect surface and therefore a heavy coat will flow slightly and the low spots will have an excess of coating. These spots will "sweat" after rubbing when all the rest of the seat is quite dry.

Skin-dried varnish will "sweat" after it has been rubbed because the hardened dense surface has been removed and the unhardened oils underneath are still in a flowing condition. One of the characteristics of oil is that it will, by capillary attraction spread out over a great area and varnishes being porous, the oil comes to the surface and spreads out in blotches. When this happens the varnish must be given more time to harden before these spots can be rubbed out.

Speeding Up Drying Process

It has been shown that the thickness of the coating effects the speed of drying and that heat speeds up the drying process but that subjecting a coat to too rapid a drying condition will, because of skin drying, delay the complete hardening of the coating. In other words, the greatest speed of drying in heated air that a given varnish will stand without skin drying to a degree that is detrimental, is determined by the thickness of the coating and the material upon which it is applied.

Inasmuch as it is by absorption of oxygen from the air that varnish hardens, it is natural that the heating of varnish coats be done with heated air. In other words, we would naturally put the coated piece in a heated room or kiln. In order to dry evenly the heat must be even. The tendency of heated air to rise would make the upper part of the kiln warmer than the bottom unless some provision was made to prevent this from being the case. The usual and simple method of procuring even temperature in all parts of a kiln is to create a rapid circulation of the air. In the thinner evaporating stage, the circulation of the air also carries away from the surface of the varinsh, the fumes which if allowed to remain would keep the oxygen from getting to the varnish and thus delay the hardening. In a large room with only a small amount of thinner fumes would not greatly delay the oxidization, but it is necessary that the air be kept fresh and nearly free of fumes. Some very efficient system of ventilation should always be provided to care for this point when the kiln is to be loaded reasonably full. The total amount of oxygen that is contained in a cubic foot of air is not great and only a small part of it available for the oxidization of oils. All other things being equal, a well ventilated kiln will harden varnish much faster than one that is not so well ventilated.

Best Drying Temperature

Experience has shown that when ventilation and circulation have been properly provided, that a temperature of about 116 to 120 degrees Fahr. is best for the average varnish used on wooden furniture and for varnish on metal such as automobile bodies, a somewhat higher temperature can be used.

In addition to the time saved there are other advantages in drying varnish in greater than work room temperatures. In a properly constructed kiln that is being operated correctly, the varnish is dust-proof, quicker and therefore cleaner. It dries with less porosity because the thinners are evaporated out of the varnish before it has stopped flowing and minute pores caused by the escaping fumes close up again. Being less porous it will last longer and not mar so easily.

In conclusion varnishes dry better and faster when heated in a kiln in which an even temperature is maintained and in which proper and adequate provision has been made for circulation and ventilation.

Overcoming Bleeding in Re-Finishing

Trouble is often experienced when enamelling or painting over surfaces that have been stained mahogany or painted red. The trouble takes the form of the bright original color working or blending through the newer finish.

Before refinishing any red surface it should be tested as a precautionary measure to see if it will bleed. Brush on a little white lead and oil paint and observe the action. Sometimes the old red is quickly dissolved by the oil, and again it takes a few days' time.

These reds are usually soluble in alcohol, oil or water, and so the first step before refinishing the surface is to remove as much of the red as possible by washing with the material which dissolves it most rapidly. The use of liquid varnish remover is usually the quickest way to take a red off interior surfaces. It would probably be too expensive to use on large outside walls. Sandpaper and steel-wool will help.

To remove a bleeding red paint from large exterior surfaces, the paint burner, steel scrapers and wire brushes are most economical. If that labor expense is too great, the next best procedure is to choose a color which will not show the effect of a bleeding red greatly—a terra-cotta, slate or buff, perhaps. That is not certain to overcome the trouble, but probably will. Reds often bleed through as many as four and five coats of white. Bleeding reds are not as commonly met with on exterior surfaces as on interior.

How to Finish Inside of Case Goods

Inside of Work Should Receive More Attention — Formulas for Inside Surfacers—Dull Finish Advisable

By Dixy Wells

More and more attention is being given to the finishing of the inside of drawers, etc., of the better quality of case goods. Manufacturers are coming to know that good work all the way through, is what counts with the best type of consumer. That portion of the public which is discriminating in its taste is influenced in its choice by the way the inside of the pieces are finished. This class of buyers is greater than is generally supposed.

Popular tastes are daily improving, and we have seen many otherwise acceptable articles rejected when the inside was poorly finished, and also when the color scheme both outside and in was not sufficiently appealing to influence the final sale. Popular taste is pretty good after all, and you can generally rely on the average. There is an old adage which runs, "Be the labor great or small, do it well or not at all," and when you consider that the cost of doing things well is very, very little more than to slip through, it certainly pays in the end, and the idea recommends itself to the most careful finisher.

Value of Careful Work

To do work indifferently is to cut down the average of good sales. Work poorly done makes a half-hearted appeal, places a greater responsibility and effort on the store salesmen, and cannot help in the long run but cut down the profits of the manufacturer. There is great advantage in having work of this character correctly done. The inside of drawers and other receptacles as a rule should be stained several shades lighter than the outside of the bureau for instance; especially if the color of the latter has been artificially deepened to any great extent.

We find that a great many goods are dipped these days, and where this is the case, it is more or less difficult to keep the inside lighter than the outside, but dipping in stain is a practice which we believe does not commend itself to the best finishers. Of course, there is economy and perhaps other advantages in dipping small parts where they can be finished off at once with a brush. We do not, however, recommend the practice of dipping everything. The inside of goods should be stained before the outside, and great care exercised to avoid dropping the darker stain on the work which is finished in a lighter shade. If the outside is stained first and then some of the darker stain will drop on the light work, you can readily imagine the blotch it would leave, and if the workman through carelessness or bad luck makes such a blotch of any considerable size on the inside, the damage can be remedied by working it out with some lighter stain, provided, of course, the remedy is applied before the blotch has become thoroughly dry.

Dull Finish for Interior

We believe it is most practical to finish the inside dull no matter whether the outside is polished or not. Many varnish manufacturers now, however, are making regular dull drawer varnish. For goods finished in egg shell gloss or dull rubbed, the inside should be done in a real flat finish, the very dull drawer varnish being used on polished stock. You will not find this always practical, but it has advantages where it is so used.

Be sure that the inside of the drawers are made smooth and soft to the touch. This matter should receive attention when selecting the varnish with which to do the work. In order to produce a smooth, soft finish, no matter what kind of varnish is used, it is necessary to have the finish properly prepared. For this we believe there is nothing better than shellac, but the high cost of this material at the present time makes it advisable to look for a less expensive article.

Some finishers have very satisfactory results in applying a glue size or some of the cheaper line of goods, but inasmuch as it is difficult to sand smooth we do not recommend it for the better grade of case goods. We would suggest as the most satisfactory way to do this work that you first stain with an oil stain, as this will not raise the grain like a water stain, and requires less sanding in order to make it perfectly smooth; or the staining may be entirely eliminated, and a colored varnish surfaces used in its stead.

Making Mahogany Surfacer

If you desire it mahogany color, the ordinary varnish surfacer that is on the market may be colored with any of the mahogany colors that are soluble in oil or turpentine. Dissolve the color matter in the proper solvent, and add to the surfacer in sufficient quantity to produce a color of the desired depth.

One may make a good surfacer for this purpose by using the following simple formula: Mix together equal parts of varnish and to each quart of this mixture add one pound of finely ground and sifted silex. Get the pure silex, as there is a substance known as silica that is sometimes called by that name, but does not produce as transparent a surfacer as the former. Let the silex and varnish mixture stand for twenty-four hours and then reduce this to a free working consistency by the addition of turpentine or other suitable reducer. A mixture of turpentine and benzine will answer the purpose and considerably reduce the cost.

You should always apply a colored surfacer with great care in order to avoid streaks and laps in the finished work. Sand the surfacer to a smooth finish when dry with a fine sandpaper. You cannot exercise too much care to have the work well dusted and cleaned off before applying the final coat. Unless the necessity for the exercise of care is impressed upon the mind of the average workman he is apt to consider this part of the work of no great importance, and accordingly slights it, but the inside corners of drawers, etc., always hold dust until the varnish brush takes it up and spreads it over the surface, unless great care is taken to remove these particles by thorough dusting.

It is always well to finish up the work on the inside before the outside varnishing is started, especially, when this can be done without holding up the work. However, when you do this you must be careful and not allow any of the flat finish to get on and remain

on the outside surface of the work. If you should be so unfortunate, wipe it off carefully at once, using a rag you have moistened with turnpentine, which it is well to always keep close at hand for this purpose.

It is possible to finish the inside of walnut goods just the same as recommended above for mahogany, coloring the surface with asphaltum varnish instead of coloring matter of mahogany shade.

Gums Used in Varnish Making

Five principal gums or resins are used in the manufacture of varnish. They are Juniper or sandarac, dammar, amber, copal and Elemi. Each is different from the other in composition and each has its particular uses in the making of varnishes.

From distant Algeria and northern Africa comes the commercial supply of sandarac, which is not great in volume. Originally it is found in long yellowish dusty tears and has an agreeable balsamic smell and is bitter to the taste. It exudes from the bark of the sandarac tree from whence it is gathered. It is used carefully in varnish for its excess renders varnish hard and brittle. Commercial sandarac is often a mixture of African resin with dammar or hard Indian copal.

Dammar is gathered from conifers of New Zealand, Queensland and India, the trees sometimes growing to enormous altitudes and attaining basic diameters, of nine feet. The resin flows spontaneously and in such quantities that it hangs like icicles varying in length from the breadth of a hand to more than 12 in. When first exuded the resin is very soft and possesses a peculiar odor, but upon drying this smell is lost. Large chunks of the resin are obtained after cutting the tree. In Asia dammar is used domestically, but in this country chiefly in the making of varnishes which dry quickly with a bright luster which is not permanent. It therefore cannot be substituted for copal or amber.

Copal is a name used more or less indiscriminately of various gums. East Indian or African is known as tender copal, while the Mexican variety is known as hard copal. Other sources are Zanzibar, Mozambique, New Caledonia, New Zealand, East India and Brazil. In New Zealand the resin is chewed by the natives much the same as our stenographers Fletcherize gum. It comes in round smooth masses, generally colorless, translucent, and is a mineral substance of vegetable origin.

The production of amber yearly is less. To-day its last big stronghold, as it has been for centuries, is the coast of the Baltic Sea. A little is found on the shores of the Adriatic and near Sicily. It is a fossil resin. Often insects, perfectly embalmed and of now extinct species, are enclosed in the amber. Some pieces have been found which weighed 13 pounds. Great amounts are used in Mohammedian worship. Its melting point is the highest of all resins, 550 degrees Fahrenheit.

Elemi is a fragrant resinous substance formerly brought from Egypt, but now obtained in America. It softens by the heat of the hand. Elemi is still used extensively as incense in Eastern countries.

Try these:—A kind thought, a kind word, a kind deed.

There was never so much need for the best as today.

Better make occasional mistakes than never try a better way.

Preparing Mahogany Veneer for Staining

To finish mahogany veneer care must be exercised to see that it is as smooth as glass before it is fitted, otherwise it is liable to be clouded. Some mahogany is so woolly that it is extremely difficult to get it quite smooth, and in order to do this some have it glue-sized before giving it the final sanding. This is a mistake, for if an oil stain is to be used it will not take properly over the glue; and if a water stain is used, the glue will soften and mix with the stain, destroying much of its transparency, and imparting to the article a murky appearance. In order to make mahogany veneer thoroughly smooth, it should be sponged with clear water before it receives its final sandpapering. This will not only raise the fuzz so that it may be cut off during the last sandpapering, but will raise any bruises that may have been made in this very soft and sensitive wood.

Sponging is an important point, and one of which there are differences of opinion. But to insure a clear brilliant, transparent finish on most mahogany it is necessary to do one or two things: to sponge it with clear water or stain it twice, sandpapering after sponging or between the coats of stain. Any difference between the two is in favor of sponging with clear water. The fuzz raises much more prominently on some mahogany than on others, which renders it necessary to sandpaper some more than others. Now, if the mahogany is stained to raise the fuzz, and some of it requires to be sanded down to the white before it becomes smooth, all the rest must be sanded equally, or it will be darker after receiving the second coat of stain, unless several different shades of stain are used This trouble is not experienced where sponging with clear water is employed, except in such rare instances where the wood is so fuzzy that none of the processes will meet its requirements.

The finishing should be done with very fine paper It is difficult to give the grade of paper to use, as different makes of paper are not graded alike, but any paper that is fine enough to glasspaper varnish without scratching should be about right for finishing after sponging. All that is required is to cut off the fuzz. If more than this is done, more fuzz is loosened and rises when the stain is applied. The paper, though fine, should be sharp, because if it is pretty well worn out it will press the fuzz down instead of cutting it off.

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Veneers and Panels

Is Thick or Thin Veneer Best?

Less Strain on Glue Joint With Lighter Face Stock—What Are Advantages of Heavy Veneer?—Suggestions for Manufacturers of Veneered Doors

By R. H. Mellatt

The relative advantages or disadvantages of thick and thin veneers are not everywhere given the attention they deserve. One may present strong arguments in favor of using either heavy or light stock, but in the main it would appear as if the thinner veneer should be given the preference. In the furniture, piano, phonograph and similar industries the veneer used is comparatively thin, from 1/16 in. to 1/32 in. in thickness, while in certain phases of interior woodwork and in the manufacture of veneered doors it seems customary to use stock ¼ in., 5/16 in. and ⅜ in. for face work. If the thinner lines are more satisfactory for casework, why should they not prove just as desirable for other forms of interior work, or on the other hand, if thick veneers give better results on interior and door work are the case goods people making a mistake when they use thin material?

Judging from the viewpoint of conservation and economy, it would appear that within reasonable limits, the thinner the veneer the better. Cutting the fancy wood in thinner sheets would tend to make the available supply of fine cabinet woods go farther, last longer, and should result in keeping the price within more reasonable limits. On the other hand, the losses due to handling would be greater and more care would have to be exercised in gluing and laying.

In Favor of Heavy Veneer

Those who pin their faith to heavy veneers usually advance two arguments; first, that the thicker stock withstands harder usage and gives better service; second, that with the thick material the glue joint is afforded better protection, for with the heavy face stock the glue line is not effected by every slight change in atmospheric conditions.

The first contention has a lot of truth in it. A blow from some sharp object which might fracture or even make a hole through a layer of thin veneer, would only make a nasty dint were the face stock heavier. Many of the examples of fine old furniture, which have been handed down from antiquity and which seems to have been fairly successful in withstanding the wear and tear of years of service, are veneered with good solid veneer ⅛ in. or more in thickness. It is doubtful if 1/32 in. stock had been used that they would be in such good shape to-day. However, there is this to be said, that furniture or any form of woodwork which may be built up with this material will stand up for many years and outlive both the manufacturer and the purchaser.

The glue joint may be given greater protection, for comparatively short periods, by a thick face veneer, but at the same time it is subjected to considerable more strain. It takes moisture longer to be transfused through ¼ in. wood to the glue line than were 1/16 in. stock is used, but if the high humidity or changed conditions hold long enough the joint will ultimately be affected. Wood, no matter how thick, will reach a constant or equalized condition if exposed to certain conditions for a sufficiently long period. That means, that storing a veneered door in a damp place or leaving it where it will be exposed to dampness or the weather, will not affect it, if such exposure if of short duration, but no matter how thick or how thin the face veneer, if left under such conditions long enough, the moisture will reach the glue joint.

Finish Does Not Keep Out Moisture

Someone may say that were the article, whether door, panel work or piece of furniture, to be painted or finished, the moisture or dampness could not penetrate to the wood, let alone the glue line. This is an erroneous impression. It has been clearly demonstrated, by the Forest Products Laboratory, that all our modern wood finishes, whether paint, enamel or varnish, are only water resistant, not water proof. That means that wood well protected by paint will slowly pick up moisture or dry out as the case may be, from the surrounding atmosphere and reach a state of equilibrium with it. Then, whether thick or thin veneer is used, whether painted or unfinished, the glue joint in any piece of veneer work will ultimately be affected by the average humidity of the climate or conditions to which it may be exposed.

This brings up the question of glue line strain. In swelling or shrinking which would exert the most force on a glue joint, thick or thin veneer? Naturally the thicker stock would and this would be in ratio to the cube of their sections. Thus a piece of face stock ¼ in. thick would exert just 84 times as great a strain on the glue joint as would a piece 1/16 in. thick, under similar conditions.

Result of Experiments

The Forests Products Laboratory at Madison, Wis., have made many experiments covering this point and have expressed themselves as follows: "It is true that thick layers of wood when glued to each other with the grain of adjacent plies at right angles, as in plywood, do develop greater stresses upon glue joints than thin veneers with a given change in moisture content. This has been shown very clearly in connection with the manufacture and testing of water resistant plywood for aircraft purposes. With an increase in the thickness of the veneer it becomes more difficult to manufacture plywood that will withstand severe water resistant tests. With good gluing methods 1/16 in. veneer and less can be made to pass very severe tests, while with 1/12 in. material a large percentage of failures usually occur, and with still thicker stock it is even more difficult to obtain highly water-resistant panels. With the thick veneer the stresses become so great that the glue joint is often ruptured. These

statements pertain to plywood made from veneer of low moisture content and with water-resistant glues.

"The thickness of the veneer along with other factors determine the rate of change in moisture content which is largely responsible for the permanency of the glue joint. The total percentage of change in the moisture content is, of course, also important. The thicker veneer, such as ¼ inch, is claimed by some manufacturers to keep out the moisture from the glue joint. While this tendency doubtless exists to some extent, it applies only within certain limits. The moisture content of a veneer ¼ inch thick does not change as quickly as one ⅛ inch and less; however, if exposed for long enough time to a constant set of conditions, the ¼ inch will eventually come to the same moisture content as the thinner veneer and will then exert a very much greater force on the glue joint. For short periods of exposure to changed conditions there may be some foundation for the statement that the thicker veneer is less affected.

"There are, of course, a number of angles from which this question may be discussed. We believe, however, that the door industry might well consider the adoption of thinner veneers for faces than they are now using. This opinion is based both upon the experiments that have been conducted here and upon the general practice of veneering in other lines of wood work."

It would appear then, that from the point of resistance to wear, tear and hard usage, the thicker sizes are to be preferred, but for ordinary service and more especially where climatic conditions are a factor, the thin material is by far the most advantageous to use.

What Constitutes Correct Pressure?

Many Faults Laid at Door of Too Heavy Application of Pressure—What is Best Pressure to Use?—Fixture of Wood and Kind of Glue Important Factors

By John Welmers

There has been a lot written about pressures with reference to veneering and possibly more said, and still there is always a bone of contention remaining to be picked. The same is true with practically all lines of work, for men are constantly on the outlook, endeavoring to find new and better ways for doing things. It is well, too, that such should be the case, for the world advances only as the ideas of men advance.

All veneered work and built-up stock owe their longevity in a certain degree to the pressures that were used in their making. I say, "in a certain degree," because if the pressures used are right and everything else wrong, it would have been just as well if no attention had been paid to the pressure.

Special Attention to Glue

Generally speaking, the glues used for veneering are not of the best, that is, in adhesive strength, and the very best glues are hardly advisable, for if conditions are proper it does not require a great deal of strength to prevent thin veneers from coming loose. But that is where the hitch is, the little word "if." We cannot expect a cheap veneer glue to hold a core, with an unequal distribution of moisture, from swelling or shrinking, but we may expect it to hold and prevent slight changes due to climatic conditions, over which we have no control. So, seeing that we use cheap glues for veneering, the thing we want to do is to get the maximum results from the glue, that it is possible to obtain.

This can be done by mixing the glues according to the manufacturers' recommendations. It is to their advantage to experiment and test in order to find the best methods of mixing their glues, so they will give most value, both in adhesion and spread, for the money spent. In the case of animal glue, a careful control of heat is essential.

No Hard and Fast Rule.

With the glues properly mixed, of the right consistency and temperature, and everything else O. K., the question of pressure naturally is of prime importance. You ask, "What is the proper pressure to use?" and, to be frank, I will say "I don't know." Carrying the thought a little further, I believe I would be safe in saying that there has yet to be laid down a hard and fast rule governing pressure, that will apply equally as well to all sorts of veneering. There are so many and varied uses of glue, and so many kinds of wood and glue, and so many densities to the same species of wood, that it would be almost impossible to expect a certain pressure to be correct in all cases.

A pressure of 100 pounds to the square inch is the favorite rule in many veneer rooms, and is found quite satisfactory. However, that is arbitrary. Different concerns use different woods and where one would find 80 pounds suitable for his purpose, another might be using 110 pounds to the square inch. One might be using a soft or pourous wood into which the glue would penetrate very easily, while the other might be using a hard non-porous wood requiring a heavier pressure to give a little penetration. In order to be sure you are getting the pressure you want on a hydraulic press, be sure to test or have tested the gauge which registers the pressure exerted.

Density of Wood Important

Porous or open face veneers act about the same as a sieve in some cases, for they fairly strain the glue, carrying it from the glued surface on the paper or caul, thus causing a starved joint, especially if the pressure used was the same that was used for a non-porous veneer. This merely furnishes an illustration which is but one of a number that require a little forethought with regard to pressure and density of glue.

The control of pressures is important, but no more so than a lot of other things. If you want perfect work, or nearly so, give equal thought to all the things that go to make a perfect panel.

The best safety device known is a careful man.

Careless habits show a poor workman.

Iron does not grind so freely as steel on emery wheels usually supplied for grinding cutters.

A special guide is needed to sharpen twist bits if you want them to cut at a very fast speed.

The installation of an exhaust shavings system is an improvement which tends to lessen the fire risk.

Drying Veneer in Specially Constructed Kiln

Material Hung on Edge From Wires Attached to Ceiling—Hot Blast Principle Employed—Gives Satisfactory Drying Conditions

A new type of veneer drying kiln, which on the whole is revolutionary in its design and method of handling the product, and yet incorporating several proven factors, which have been in more or less general use, has been successfully built and operated by the Forest Products Co. at its Linnton, Ore., plant.

As the particular drying problem confronting the company's operation not being easily overcome by the use of other methods except at prohibitive expense, R. L. Rankin, plant manager for the company, created a plan of operation in which the hanging of the veneers was the controlling feature. The material is hung, on edge, in the kilns after the manner employed in hanging hardwood face veneers in slow-drying seasoning chambers or as clothes are hung on a line on wash day.

Special Clip is Developed

In order to accomplish this, it was first necessary to perfect a double-ended spring clip strong enough to hold several sheets of veneer suspended, one upon the other, from the wires stretched lengthwise the roof of the kiln. This resulted in the perfecting of a clip similar to those used by photographers in hanging prints, except the former would sustain a pulling strength of 50 pounds.

Two kiln chambers were built by the company with a capacity of 15,000 feet of veneer each; wires are run lengthwise the room, 1½ inches apart and stapled to the ceiling joists. From these wires the sheets are hung, on one other, from the ceiling to within a foot or so of the floor.

After the chamber has been filled to capacity, a large blower fan delivering sufficient air to create a strong circulation is started up. The air, previously heated by passing over a heating element of pipe coils, is forced into the chamber at the top, where it is distributed through openings in the ceiling and down through the veneer, where the moisture-laden air is taken out through return ducts at the bottom of the walls along the floor line. The air is then returned through the heater, thence into the fan, and back into the kiln again, picking up moisture from the veneer while in transit. Should the air become too heavily laden with moisture, or, correctly expressed, the humidity become too high, part of the moisture is condensed between leaving the kiln and before it returns to the heater, thus allowing the controlling of the humidity, to the end that the most economical point is maintained to promote perfect drying conditions.

Capacity 70,000 Feet in Eight Hours

While one chamber of veneer is passing through the drying period, the other is discharged and charged, thus enabling the drying of 70,000 surface feet of veneer during two eight hour periods out of each 24 hours, while the third eight-hour period is occupied in discharging one kiln while the other is being charged. This schedule makes possible the drying of 140,000 surface feet in each 24 hours.

Means have been provided whereby the temperature of the air entering the chamber may be regulated with a thermostatic controller, which opens up the steam valve on the heater coils or shuts it as the temperature reaches minimum or maximum. Condensation from the heater coils is trapped and returned to the boiler, where it is used again. Waste from the cutting plant more than provides fuel for the boiler.

Three-sixteenths and one fourth inch veneer sheets are dried to a satisfactory percentage of moisture content, in eight hours with ease. Where the material is fir it has been dried in six hours, leaving the material in excellent condition.

Owing to the fact that there are no sticks used in separating the veneers, the air circulation and the shrinkage, is not retarded, which allows for a most uniform condition of drying and prevents the usual buckling and checking to be found where conditions are not uniform. With this method of hanging the veneers, the same may be closely inspected at any time as the drying operation proceeds, and the conditions may be easily changed if not satisfactory. Actual results show that the larger sheets of veneers can be hung with half the labor that it takes to pile it on sticks, and can be taken down with nearly one-third the effort.

A platform four feet high on castors is used in hanging the top sheets, and the lower sheets are hung by standing on the floor. The cut-downs and small percentage of narrow stock accruing from the operation are placed on sticks in one end of the kiln.

He Didn't Notice

For 20 years two chess players met daily at Brown's chophouse, took their places silently, silently played their game, and silently departed. For 20 years a third party sat by and looked on.

Then one of the players failed to show up—for the first time in 20 years. After waiting a few minutes, his partner said to the onlooker, "I guess he isn't coming to-day. Will you play his men?" "Sorry," was the answer, "but I don't know the game."

He had followed every move for 20 years, but he didn't know the game. He had watched the drama of king and castle for two decades without sensing a single undercurrent of strategy, speculating on a single motive or anticipating a single coup.

He had displayed infinite patience in looking at the game, but he couldn't be bothered looking into it. He showed every symptom of life except its first symptom—curiosity.

He belonged to that listless army of passive observers who clutter up the sidelines of business—men who look without seeing, listen without hearing, do without understanding.

Placed in an office—at a bench—he would remain 20 years ignorant of his neighbor's job, his superior's problems, his own significance. When the opportunity for advancement came he would have to say, "Sorry, but I don't know the game."

The petrol engine will play a big part in the future in cutting logs to sizes in the woods.

The ball bearing seems to be in a fair way of ousting the ordinary self-lubricating one.

Treatise on Vegetable and Casein Glue

Development and Application of These Two Adhesives—Improved Conditions in Glue Room—Invaluable for Export Trade

By Fred M. Knappen*

For some time prior to the outbreak of the world war, manufacturers of glued work had been experimenting with substitutes for hide glue, which for years had been the standard adhesive of the trade. These experiments tended toward the adaptation of certain starches processed and treated in such a manner as to form an adhesive paste suitable for use in the manufacture of plywood.

The starch obtained from the root of the cassava seemed to meet with the greatest success and to most nearly approximate hide glue. This plant grows in Java and often is erroneously called tapioca, this error arising from the fact that commercial or edible tapioca is a product of the same root, but manufactured in a different manner. This prepared cassava starch had come into quite general use by the time the United States entered the war in 1917, owing partly to its merits as an adhesive and partly to the scarcity of hide glue.

Hide Glue in Tire Manufacture

Not only was hide glue hard to obtain, but its cost has increased to an unreasonable point due to the shutting off of foreign sources of supply which previously had furnished a large proportion of the raw stock entering into the glue manufactured in this country. About this time the automobile tire industry began to assume large proportions and to absorb nearly all of the animal glue produced in this country. It is due to this ever increasing demand that, even after the war, the scarcity and high price of this production continued to the practical exclusion of other industries which formerly had been large consumers.

Unfortunately, for the manufacturers and users of cassava glue, the conditions which prevented the importation of raw stock for hide glue also restricted the importation of cassava flour by commandeering a large part of the bottoms which had previously been engaged in oriental trade, and employing them in the transportation of war materials and supplies.

To this restriction was added the ruling of the government which classified cassava flour as a foodstuff and prohibited its importation for commercial purposes. This culminated in the use, by the various demands for this flour, the result of which was the manufacture of a number of most ungodly preparations, which made the lives of the users thereof far from one sweet song. With the cessation of hostilities and the resumption of normal trade, these glues naturally resolved back into their original forms, until they now are giving as good results as those obtained before their down fall.

Casein Glue Developed

During this same pre-war period, the manufacturers of casein, whose product for years had been used as a sizing in the manufacture of straw goods and as a coating for certain papers, had been seeking further use for their product, which in combination with certain chemicals formed an adhesive possessing waterproof qualities. Up to the time of the outbreak of the war very little was used in the woodworking industry except in the manufacture of the cheaper kinds of plywood, especially shooks for packing cases.

The war, with its necessity for waterproof plywood, created an insistent demand for a satisfactory adhesive. To meet this, the manufacture of casein products bent every energy to the production of a successful glue which would meet the exacting requirements of government specifications. At the start this adhesive was rather cumbersome and required an expert to properly mix its components, which was done in an agitator; but constant laboratory work on the part of the producers soon resulted in a powder product in which the ingredients were properly combined and required only the addition of water at the mixer.

The principal difficulty encountered in the use of this glue was its extreme hardness, with its attendant effect upon tools. This difficulty has now been overcome to a large extent, by decreasing the proportion of one of its ingredients. This change in formula has, to some extent, sacrificed the waterproof qualities of the glue, but has resulted in a product better suited to the requirements of a commercial work where absolute waterproofing is not a prime requisite.

Same Equipment Suitable

A double beater mixer is used in the preparation of both cassava and casein glues, and is equippel with a steam jacket for cooking cassava flour, but which is not necessary when mixing casein. A corrugated roll spreader, having tanks for both upper and lower rolls, is used in applying both of these glues. This uniformity of equipment makes it possible for manufacturers using these glues to use either one at will as the demands of their output may require.

It is now rather doubtful if many users of either starch or casein adhesives would consider resuming the use of animal glues, even though the price were to be restored to a competitive basis. The practically compulsory use of these substitutes has taught their superiorities in various ways; the outstanding advantages in their use being the comparative ease of preparation, the improved glue room conditions due to their use when cold, and the sustained uniformity in consistency after mixing.

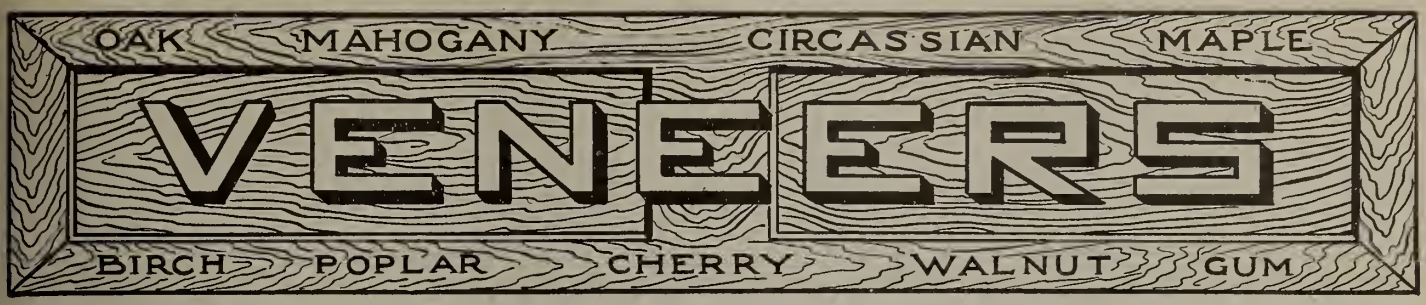
Tensile Strength and Holding Power

Casein glues have a tensile strength equal to, if not exceeding, that possessed by the best hide joint-glues; while that of starch glues, though adequate for nearly all ordinary veneering purposes, is lower on a comparative scale. This higher adhering quality makes possible a much thinner spread for the same relative holding power. The thinner spread decreases the amount of moisture to be absorbed by the wood during gluing, thus decreasing the length and time necessary for drying out panels and minimizing the danger of warping.

In preparing stock for the glue room, when casein glue is to be used, it is unnecessary to reduce the moisture content of the veneers to the point required when vegetable or animal glues are used. In fact experiments conducted by the Forest Products Labor-

(Continued on page 124)

*Grand Rapids Veneer Works, Grand Rapids, Mich. Address National Veneer Panel Manufacturers' Association.



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NATIONAL VENEER & LUMBER CO.

AMERICAN WALNUT VENEER
Long Wood and Butts

QUARTERED WHITE OAK VENEER
Sawed and Sliced

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OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Litton Veneer Co.

Manufacturers

American Walnut, Figured Gum, Sliced Quartered Oak, and all Kinds of Figured Woods

Walnut and Quartered Oak Lumber

Office and Mill
ROCKFORD - ILLINOIS

Panels and Rotary Cut Veneers

Considering the present large demand for high-grade cabinets and the extreme scarcity of good panels, it may interest you to know, Mr. Manufacturer, that we now have in stock, and can make immediate shipment of, a very large quantity of both three and five-ply panels for talking machines in either

**Mahogany,
American Walnut,
Quarter Sawed Oak**

We also have for immediate disposal a large supply of birch and gum panels adaptable for shelving.
We are in position to take orders for future delivery. Order now for holiday trade.
We have just received a big shipment of single ply spruce for horn stock. Write us for prices on cross banding and core stock.

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SUPPLYING HIGH GRADE
Veneered Panels
IN ANY SIZE, THICKNESS
OR KIND OF WOOD

Immediate Shipment on all Stock Sizes in Walnut, Plain Oak, Birch, Mahogony, Etc.

Immediate Delivery

FROM STOCK OR
TO YOUR ORDER

Veneered Panels

Veneers—Wood Dowels

Adolph Sturm Company
ESTABLISHED 1869
542-544 West Washington Street,
Offices, Mills and Warehouses
CHICAGO, ILLINOIS, U.S.A.

Reg. U.S. HB Pat. off.

EST. 1867
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OUR MANUFACTURING FACILITIES

Rotary Cut Veneer, at Burnside, Kentucky, Sawed Veneer, at Fort Wayne, Indiana
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ROTARY CUT VENEER

1/8″	Gum	Sheet Stock
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1/16″	Yellow Poplar	Sheet Stock
1/8″	Yellow Pine	Sheet Stock
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1/8″	Red Oak	Sheet Stock
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In carloads or less than carload shipments.

SAWED VENEERS—1/20″ Qtd. White Oak.
Other thicknesses and woods on order—ample facilities.

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3/8″, 1/2″, 5/8″, 4/4″ Qtd. White Oak, Common and Better dry and ready to ship.
3/8″, 1/2″, 5/8″, 4/4″ American Walnut, Common and Better dry and ready to ship.
Also Plain Red Oak, Ash, Beech, Hard Maple, Poplar, Elm, and other Northern Hardwoods

HOFFMAN BROS. COMPANY

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VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Western Office, 516 Lumber Exchange, MINNEAPOLIS, MINN. Mills at GLADSTONE, MICHIGAN

The Northwestern Cooperage & Lumber Co., Gladstone, Mich.

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Manufacturers of

"PEERLESS" ROTARY CUT VENEERS

in Birch, Elm, Basswood, Maple, Ash and Beech for all purposes

Also hoops, liners and staves for manufacture of packages

Also "Peerless" Rock Maple, Beech and Birch flooring; Hemlock lumber; Lath, etc.
"Peerless" products are standard everywhere and you are always exercising Safety First in using them. Try us next time.
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Don't Waste Time "Shopping" for Prices

Write or wire your order to us! Prices always right!

5 Million feet of Choice

Rotary Cut - Sliced - Sawn

Domestic and Imported

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VENEER MANUFACTURERS COMPANY

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We are Chicago agents for WOCO FIR PANELS, and carry a full and complete line in all stock sizes and all thicknesses at our Chicago warehouse for immediate shipment.

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WE HAVE A COMPLETE STOCK OF 3 and 5 PLY PANELS IN VARIOUS WOODS AND THICKNESSES FOR QUICK SHIPMENT

Also offer 3/8" 3 ply Fir s-2-s Panels for Drawer Bottoms and Backing.
1/8" Rotary Cut Northern Red Oak
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1/8" Birch Veneer 6 to 36" wide 60 to 86" long.
Panels also made to your dimensions.

Write for Prices

GEO. L. WAETJEN & CO.

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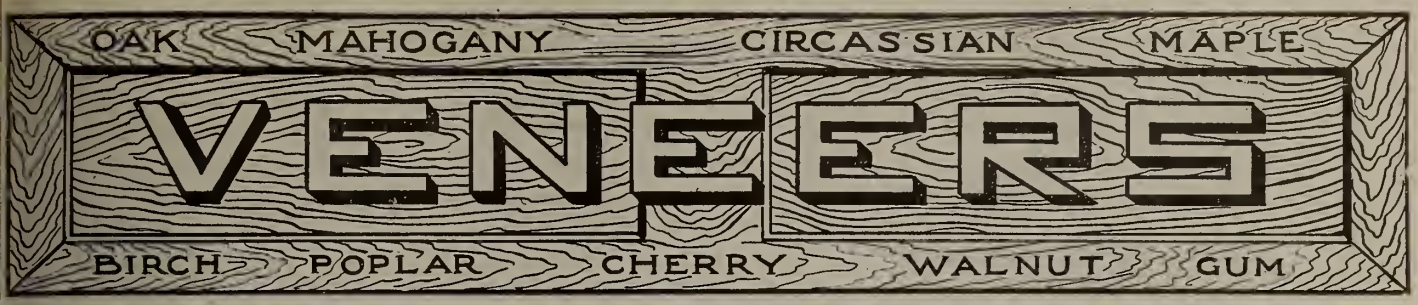

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Our walnut veneer cannot be beat, both in plain and figured wood.

Write us for prices.

Central Veneer Company
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Southern Veneer Manufacturing Co., Inc.
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Importers and Manufacturers of all kinds of Sawed, Sliced and Rotary-cut

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CARRYING

a large stock of selected Mahogany, Figured and Plain Walnut, Walnut Butts, Sawed and Sliced Quartered Oak and Sycamore and all other native woods.

1,000,000 Feet
QUARTERED RED GUM
to select from

WE Respectfully solicit your inquiries

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Quality and Service

Ask

Henry S. Holden
1742 Monadnock Block
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Wide Veneer

One carload of 1/20″
Quartered White Oak
Sawed Veneer
12″ and wider

Ready for Quick Shipment.

Memphis Veneer & Lumber Co.
MEMPHIS, TENN.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SAVE FREIGHT

Rotary Cut Birch and Gum

Why pay freight on gum veneers from southern points when our cutting mill is so near the border.

PANELS

We manufacture Tops, Fronts and Panels of all kinds

Ask for our "Ready to Ship" Stock List

MOHAWK VENEER CO., INC.

Warren, Pa.

Plywood Dept. Warren, Pa.

Cutting Mill Salisbury Center, N.Y.

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Lumber

Plain and Fancy VENEERS

Mahogany, Walnut Birch, Ash, Poplar

Rotary, Sliced or Sawed in all Thicknesses

Built up Stock in Birch and Maple

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QUALITY *SERVICE*

PICKREL VENEER COMPANY, Inc.

MANUFACTURERS OF

American Walnut

Exclusively

Woodruff and River *New Albany, Ind.*

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Exclusive Manufacturers American Walnut Lumber and Veneers

AMERICAN BLACK WALNUT LUMBER

3/8"	FAS	6-9¼"	wide,	8-16'	long	3,600'	12/4"	FAS	10" & up wide	"	1,735'
1/2	"	"	"	"		20,902	16/4	"	"	"	2,180
5/8	"	"	"	"		26,330	3/8"	FAS	6" & up wide,	6/7'	long 1,290'
3/4	"	"	"	"		25,962	1/2	"	"	"	5,790
4/4	"	"	"	"		72,502	5/8	"	"	"	840
5/4	"	"	"	"		16,766	3/4	"	"	"	8,940
6/4	"	"	"	"		39,201	4/4	"	"	"	21,040
8/4	"	"	"	"		23,140	5/4	"	"	"	2,400
10/4	"	"	"	"		14,245	6/4	"	"	"	7,807
12/4	"	"	"	"		4,130	8/4	"	"	"	1,200
16/4	"	"	"	"		1,180	10/4	"	"	"	1,200
1/2"	FAS	10" & up	wide	"		9,680'	12/4	"	"	"	240
5/8	"	"	"	"		10,980	16/4	"	"	"	250
3/4	"	"	"	"		14,830	4/4"	Selects			36,935'
4/4	"	"	"	"		28,873	5/4	"			26,462
5/4	"	"	"	"		14,165	6/4	"			25,437
6/4	"	"	"	"		10,262	8/4	"			38,560
8/4	"	"	"	"		11,920	10/4	"			3,100
10/4	"	"	"	"		5,250					

3/8"	No. 1	Common				9,216'					
1/2	"					29,410					
5/8	"					16,815					
3/4	"					31,285					
4/4	"					79,030					
5/4	"					49,412					
6/4	"					22,710					
8/4	"					37,380					
10/4	"					600					
12/4	"					315					
16/4	"					420					
1/2"	No. 2	Common				1,910'					
5/8	"					4,200					
3/4	"					2,190					
4/4	"					70,560					
5/4	"					41,893					
6/4	"					30,727					
8/4	"					40,170					
10/4	"					1,687					

Write for prices on any items you are interested in *"PENROD SERVICE" Satisfies*

C. A. Rugg, 115 Foots Avenue, Jamestown, N. Y., Eastern Representative.

Geo. C. Hall, 610 South Michigan St., Representative for Chicago and Michigan territory.

INVESTIGATE

P.-J. SERVICE

For high-grade rotary cut veneer, that is smooth and evenly cut and dried by mechanical means to any percentage of moisture desired.

We also operate large band mills where all kinds of southern hardwood lumber is cut from our own tract of timber in the very heart of the Saint Francis Basin District, Arkansas.

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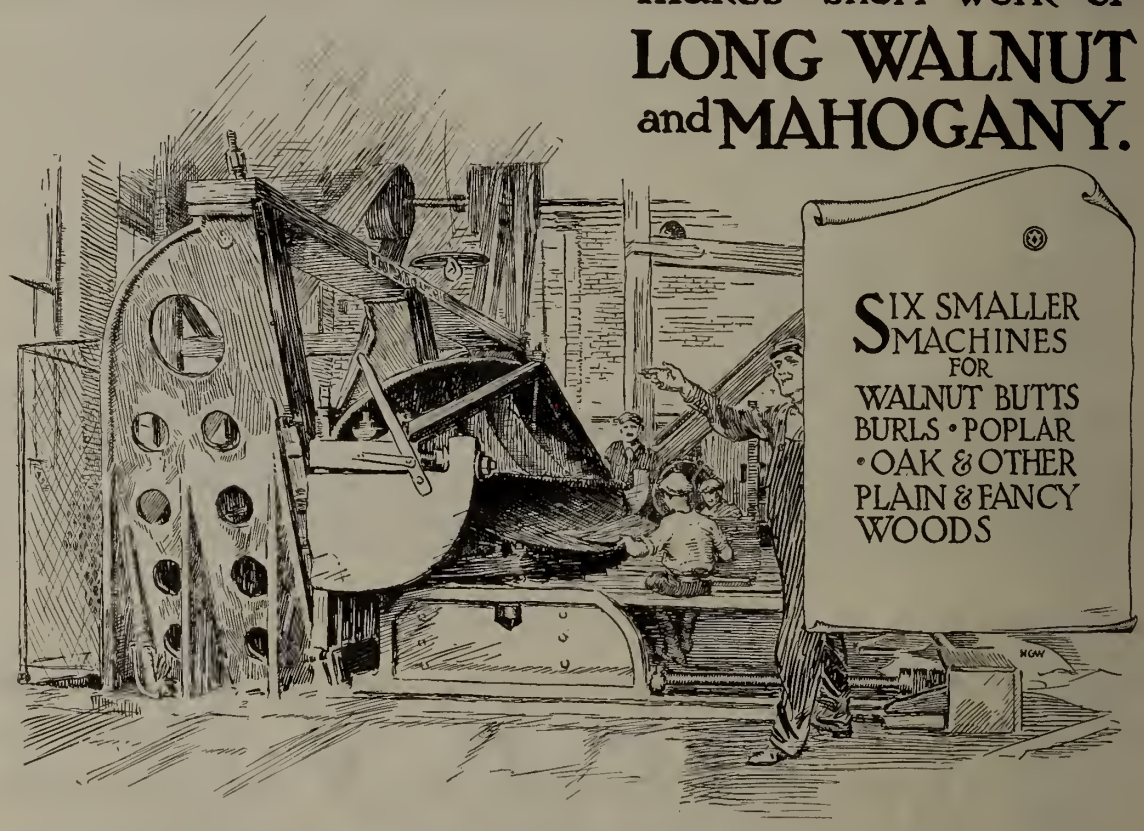
OUR SEVENTEEN FOOT SLICER
makes short work of
LONG WALNUT
and MAHOGANY.



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Mills - BALTIMORE, MD.
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EVANSVILLE VENEER COMPANY

has a reputation and financial worth that guarantee satisfaction.

We give attention to the little details that make a perfect product, a dependable service and a satisfactory veneer connection that will function with your organization.

Our organization is large enough that we meet the conditions and give you absolute protection against changes.

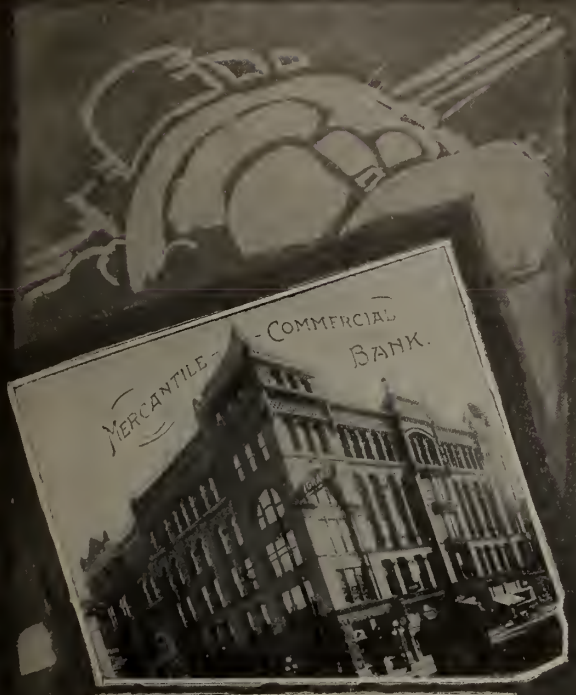
The quality of our veneer is above question, and our line consists of

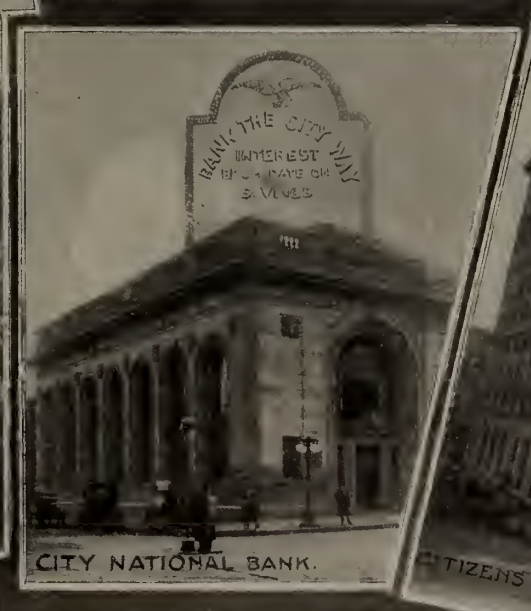
QUARTERED OAK
SLICED WALNUT
FIGURED RED GUM
ROTARY PLAIN WHITE OAK AND GUM

We carry large stocks ready for quick LCL shipments.

A GROUP OF EVANSVILLE BANKS

THE Evansville Veneer Co.
MANUFACTURERS OF
VENEERS.
EVANSVILLE, IND





Treatise on Vegetable and Casein Glue

(Continued from page 114)

atory show that with casein the best results were obtained when the moisture content of veneers was considerably greater than the allowable maximum when used with other glues.

It is the practice of a large number of wood finishers to employ dipping tanks for the application of water stains. Assembled cabinets are emersed in the stain and then hung up to drip. This is bad enough; but some, to hasten drying, put the wet cabinets in a room with an excessively high temperature. This almost surely results in disentegration of the panels built with a starch or even an animal glue, but has no effect upon panels made up with a casein glue.

During the past few years, owing to the inability of plywood manufacturers to produce the vast amount of built up stock required by the woodworking industry, a great many large consumers were obliged to install complete gluing departments in order to insure their supply. With the coming of normal conditions, these installations will not be adandoned. In order to keep their large plants in full production, it will be necessary for plywood manufacturers to enter the export field more extensively than heretofore. This necessitates the use of a water resistant glue which will not be affected by storage in damp warehouses and hulls of vessels, or by the stresses occasioned by the heat and humidity of the southern lattitudes. The requirements of this trade are met by casein—only partially by other glues.

Lack of Standard in Glues

There is no drawback which has a direct bearing upon the satisfactory use of either of the glues described above. I refer to the lack of standards. As many of you gentlemen know, the Plywood Manufacturers' Association has taken official cognizance of this condition and has made arrangements with an industrial chemical laboratory to develop a set of standards covering these glues. In the near future it may be possible to purchase glue on specification and be assured of a uniform product suitable for the purpose for which it is intended. The successful completion of this work undertaken by the association, while of great benefit to its members, cannot fail to have an effect upon the entire glue-using industry, and for this reason should receive the support of all those interested in the use of these glues.

Shrinkage of Veneer from Boiled and Steamed Logs

According to present practice, logs which are to be cut into veneer are either steamed or soaked in hot or boiling water for several hours to soften the wood. The claim is sometimes made that the veneer from boiled logs is likely to shrink and swell less with changing moisture content than the veneer from steamed logs. This point was made the subject of investigation by the Forest Products Laboratory at a plant using both methods of preparing the logs.

Thirty sheets of 1/12 inch rotary-cut birch veneer, 60 inches square, were selected from about six logs prepared in each way. The sheets were carefully measured, passed through a textile drier, and measured again.

The average moisture content of the boiled veneer and that of the steamed before drying was practically the same, being 64.8 and 65.5 per cent., respectively. The average moisture content for both kinds after passing through the drier was 10 per cent., and the moisture contents of all dried sheets were between 7 and 13 per cent.

The shrinkage caused by drying was found to be the same for both kinds of veneer. When the dried sheets were resoaked, they expanded to their original dimensions, and when subjected to a second drying shrank as uniformly as before.

Although these tests were very crude, they indicate that the shrinkage of veneer from boiled and steamed logs is practically the same. The variation is no greater than is found between pieces from different logs which have undergone the same treatment.

Moisture Content of Wood Independent of Density

Even after long exposure to the same atmospheric conditions, different pieces of wood do not have exactly the same moisture content. Variations of 2 per cent. were recently found in red oak blocks stored under carefully fixed humidity conditions at the Forest Products Laboratory.

These moisture differences, unlike variations in strength, are apparently independent of the density of the pieces. In the laboratory experiments, the variation proved to be as great in blocks of the same density as it was throughout the lot of specimens. Moreover, the range in moisture content was the same in wood of low density as in wood of medium density or high density.

Data on a few representative specimens are given in the accompanying table:

Density of specimen	Average moisture content in percentage of weight oven dry Relative humidity at 80° F.		
	38%	61%	88%
Low			
.519	7.6	11.2	19.4
.527	6.0	10.0	17.4
.536	6.5	11.0	18.2
Medium			
.630	7.7	11.3	18.9
.539	5.8	10.7	18.3
.643	6.8	11.3	19.5
High			
.720	6.4	11.2	19.3
.724	7.4	11.4	19.6
.753	6.1	10.8	18.8
Total average	6.7	11.0	18.8

100% EXCELLENCE

Manufacturing
High Grade ROTARY CUT VENEERS
Specializing BIRCH DOOR STOCK,
MAPLE PIANO PIN BLOCK STOCK

Years of Experience Behind Our Products

The Munising Woodenware Co.
MUNISING, MICH.

OUR PRODUCT IS FOUND AMONG DISCRIMINATING BUYERS

BECAUSE we have perfected every detail of our organization. Each department was planned with painstaking care with the definite end in view of a product of unsurpassed quality. This involves a rigid selection of logs by expert log buyers surveying a wide territory, perfect mechanical equipment and its undeviatingly correct use. Our four band mills and three veneer mills manufacture the best obtainable in quartered and plain white oak lumber, sawed quartered oak veneers, walnut lumber and sliced and rotary cut walnut veneers, rotary cut yellow poplar crossbanding and a general line of high grade hardwoods.

WOOD-MOSAIC COMPANY
INCORPORATED
LOUISVILLE, KENTUCKY

THE EQUIPMENT IN OUR THREE VENEER MILLS IS ALL MODERN AND IN EACH CASE DEVOTED TO CUTTING ONLY THAT CLASS OF MATERIAL FOR WHICH IT WAS PLANNED

Hardwood as a Heavy Duty Flooring

Writer Says Profitable Field Being Overlooked—Oak Floor Gives Fifty Years Service in Foundry—Has Many Strong Features

By R. J. Stone

Sometimes a manufacturer of oak flooring experiences difficulty in disposing of some of the lower grades of flooring which are culled out from his product. A market for this material that is often overlooked, or, at least, is not receiving the attention it should, is to be found in industrial buildings, including factories and warehouses. Here is a field, which, if worked consistently and aggressively, is capable of absorbing a large quantity of such material.

This is a business that requires a little working up. The choice of material for flooring in factories, warehouses, mills and similar buildings, where there is heavy traffic, is not always given the careful consideration it should receive. In such structures the material for flooring is all-important. The floor in a warehouse, for instance, is often renewed a number of times before any extensive repairs are necessary on the overhead construction.

Require Special Consideration.

The floor is not like the walls, on which there is no wear and tear. It is in daily use as a part of the working equipment. Different conditions require different degrees of endurance in the floor. One that stands the strain in one factory may not do at all in another. It depends upon the nature of the work done, whether there is trucking, etc.

On every hand are examples of building designed with great care as to appearance, but having inferior floors which are a constant source of trouble, delay and expense. In looking over the situation before deciding upon the flooring, the careful business man should ask many questions about any type of flooring suggested.

No. 2 common oak flooring, formerly known by the trade name of "factory oak flooring," is the most suitable flooring for factory and warehouse purposes. It is strong and heavy, tough and resilient. It is not subject to premature decay, like some other hardwood flooring. It is less susceptible to the degeneration known as "dry rot." Its cell walls are thicker, offering much more resistance to the boring operations carried on by the spores of the low order of parasite which causes "dry rot."

Economical and Efficient.

Where there is trucking to be considered, tightly fitted, blind-nailed oak flooring in this grade presents the ideal trucking floor. It means greater ease and speed, which mean greater efficiency. How often workmen are seen slamming and banging a heavily-loaded truck over an uneven floor, damaging alike the truck, the merchandise, the floor and their own tempers? In large buildings where the annual cleaning bill runs into thousands of dollars, the facility with which such flooring can be swept and cleaned means a big reduction in maintenance cost. The light flooring oils, made expressly for this purpose by many paint and varnish houses, make an economical finish for the factory or warehouse floors, where a high-class finish is not desired. It helps to preserve the floor and keeps dust from rising.

The modern business man realizes that the health and general well-being of his workers are only other ways of increasing efficiency. Anything which affects the health or spirits of employees is always reflected in production. The clean, bright appearance of a good floor in office, storeroom, or workshop, goes a long way towards creating contentment. Concrete or stone floors are cold, hard, and "dead." They are tiring to the feet and very detrimental to the health. It is a common sight in factories, where concrete floors are used, to see a workman standing on a plank before his machine, thus offering the highest testimony to the fact that he does not like such a floor. Concrete floors are also destructive to tools and fragile articles which may be dropped on them.

Give Long Service

Instances may be cited which show the long life and service given by oak floors in industrial buildings. Perhaps one of the most striking examples is that of a large manufacturer of gasoline engines who laid an oak floor in his foundry fifty years ago and it is still in service. What other type of flooring would give such service? Besides, it is warm under foot, easily kept clean and has many other advantages not possessed by other flooring materials. What has been said about oak, applies more or less to all kinds of hardwood flooring.

If oak flooring is so suitable and serviceable for heavy duty floors, what steps are being taken to impress such facts upon architects, contractors and owners of large industrial buildings. Many figure that anything of oak is too expensive for ordinary use or ordinary purposes. Such is not the case. Factory or No. 2 common oak flooring could be sold at a price that should compare favorably with any other similar product on the market and in view of the service rendered it should be especially desirable. The standard sizes for such heavy duty flooring are 13/16 in. x 1¾ in., 2 in. or 2¼ in.

Course on Kiln Drying

How to assist the lumber dealer to prevent loss in the kiln drying of lumber is the basis of the Short Course in Dry Kiln Engineering to be given at the New York State College of Forestry at Syracuse from March 7 to March 25.

Extensive experiments have been carried out by the Utilization Department under the direction of Prof. H. L. Henderson and several interesting features have developed which will form the subject of discussion in the Short Course. It is the aim of Professor Henderson who has charge of this work, to demonstrate by laboratory exercises and lectures the economic use of kilns of various types and to give the men a thorough drill in kiln operation. Many prominent experts have been scheduled for talks and demonstrations in kiln work which will be invaluable aid to the men taking the course.

A circular saw properly sharpened makes less noise than one with the teeth all shapes and sizes.

VENEER OF QUALITY

We carry in stock, for immediate shipment, 3 and 5 ply Panels in Birch, Oak, and Mahogany — sizes 24" and 30" wide, 48", 60" and 72" long.

A complete range of American Walnut, Mahogany, Quartered Oak (in all thicknesses) Figured Gum Veneers and Rotary Cut Veneers is stocked at our plant awaiting your selection.

Our best advertisement is a **trial order**—because more orders come pouring in with requests to "repeat the same quality."

This is not a difficult request for us to fill because we handle nothing else but **quality veneers.** Let us convince **you.**

Toronto Veneer Co., Ltd.
1100-1104 Queen St. West, TORONTO, ONT.

Walnut, Quartered White Oak and Mahogany Veneers and Lumber

Prompt Delivery

LONG-KNIGHT LUMBER COMPANY
INDIANAPOLIS, IND.

Shall Wages Be Reduced or Maintained?

(Continued from page 69)

up, as we are short of houses, therefore people take advantage and put up rents. Re cost of living, we cannot see that it has come down but very little; we think wages here are a little lower than in Montreal.

"Our rates are from 50 to 60c an hour and we think others round here are paying about the same."

What Ontario Manufacturers Have to Say

Sees signs of increased efficiency. "There has been no change in our factory up to the present time, although we have had considerable unemployment in one or two departments. We also note that we have been getting better service from our employees, especially the casual kind, not our regular men, but those who during the last year or two have been drifting and very independent as to whether they worked or not.

"We think that in the course of the general readjustment of prices which has taken place, that wages will be somewhat reduced, but not until living conditions are more favorable. The journeymen carpenters have made a demand for a higher wage rate for the coming season, but we think that this is largely to offset any move which might be made by their employers in the way of a reduction. Nothing can be definitely said, however, until a month or two later, when we will know pretty well how the spring work will open up."

* * *

Asking employees for increased productiveness. "Insofar as our company is concerned, we do not anticipate making any reduction in wages. We believe that the wages we are paying, which are about as follows, are none too high:

55c to 60c for machine men.
65c to 75c for department foremen.
40c for ordinary labor.

"We are putting it up to our employees, however, to increase their efficiency by greater production. We may say that we have interviewed others in the woodworking industry, that are operating along lines similar to our own and they expressed their desire to maintain the wages they are paying at the present rate."

Sharp Decline Not Desirable

Ontario woodworker advices caution and co-operation. "It would seem to us that lower wages will prevail. Commodity costs are gradually coming down and the cost of production will also have to come down if the industry is to remain solvent. Wages in the woodworking industry will necessarily have to adjust themselves to the general level. A cut in wages would not cause increased demand for wood products, but like every other commodity, wood products cannot be sold for any protracted period at prices less than production costs.

"As to whether mechanics or laborers are receiving too high scales of wages is something that it is hard to say. All values are necessarily relative. For example: If it were possible to establish a standard of wages one hundred per cent. higher than the present levels, the same standard of efficiency being maintained, the production costs would respond and things generally would remain just about as at the present. Now deal with the question from a purely national standpoint. The scale of wages that must prevail will always have to bear a very direct relation to the world value of the product being produced. It is our opinion that employers of labor should do everything possible to prevent a sharp decline in wages. It is not in the interest of Canada, in our opinion, that wages be reduced beyond a point actually necessary to make possible the production of Canadian commodities on a cost basis that would keep Canadian industry alive and permit us to compete with the rest of the world.

"It should be the aim of all to maintain Canadian standards at the highest possible level and to do this to that end we would welcome anything in the nature of a concerted effort on the part of the manufacturer and employer of labor generally."

More Employers Favor Present Rates

Average scale should be maintained. "In our case a reduction is hardly justifiable for the reason that we feel we have not paid the maximum rate. If we had we would certainly introduce a lower scale without hesitation. To be frank, our policy has been to give a man steady work. Therefore, he is satisfied with a lower wage, which is more to him in the long run.

"We are paying as follows:

Head sash and frame maker	75c
Next man	65c
Sticker hand	50c
Machine hands	45c
Yard men	40c

"This is a fair wage, as we work 10 hours per day, with the exception of about three months in the winter. If there are many firms that are forced to pay the maximum they should get it down to do it quick."

* * *

No change for the present. "We do not believe there can be any reduction in the wages paid to skilled employees at the present time, though a slight reduction in the wages paid to unskilled labor might be made in some factories.

"Our rates of pay at present are as follows:

Foremen	60c an hour
Machine operators	50-55c an hour
Bench hands	50-55c an hour
Yard and general help	35-40c an hour

"We do not believe a reduction should be made. The wages paid in other industries in this district average about the same. The cost of living has not been reduced enough to be a very great help to the average working man and we believe that the wages paid at present should prevail for a time.

"There is no doubt in our minds that a reduction in wages would increase sales."

* * *

Increased production the solution. "The question as to the wisdom of endeavoring to reduce wages at the present time, when the country is in a more or less unsettled condition, as regarding labor, is a very ticklish one. It is our opinion, that if wages can be maintained and production increased, the country will be in a stronger position, and more money will be in circulation, as the working man, when in possession of money, is a free spender. The essential point is that production must be increased and the man receiving 60c per hour must produce 60c worth per hour. If the working man realizes this, and gives an honest day's work in return for an honest wage, the cost of building and building materials will be reduced considerably."

When reconstructing the mill along modern lines, don't forget the transport of material. Tracks, transveyors, conveyors, lifts, etc., will make up for the shortage of labor.

MANUFACTURER
OF
PLAIN AND QUARTERED
SOFT KENTUCKY RIVER OAK
MOUNTAIN POPLAR
WALNUT
ASH

LELAND G. BANNING
CINCINNATI, OHIO

Canadian Representative:
A. E. KLIPPERT,
11 LAXTON AVE.,
TORONTO, ONT.

MILL:
FRANKFORT, KY.

1897 1853 1921

Veneered Panels

Ready for quick shipment in following veneers

Walnut, Plain Oak, Birch, Quartered Oak, Mahogany, and Maple.

3 Ply—1/4" thick and 5 Ply—3/8" thick.
Sizes—72 x 24, 60 x 30, 60 x 24, 56 x 25, 60 x 20, 60 x 18, 48 x 18.
also in quantities cut to size for
PHONOGRAPH CABINETS, FURNITURE DRAWER BOTTOMS, ETC.

Hay & Co., Ltd.

Woodstock, Ontario

The Lumber Market

Domestic Woods

The situation with regard to domestic woods, such as pine, spruce, basswood, birch, maple, shows signs of improving. That is, enquiries have been more numerous during the past few weeks and more lumber has been sold. The feeling is rife in local circles that the tide has definitely turned and that from now on there will be a steady improvement. Prices ,which are off anywhere from 30 to 45 per cent. from those which prevailed a year ago, are expected to show a slight upward tendency, though it is not anticipated that the high levels of 1920 will be reached.

While the peak prices of last year are not expected to be touched, local woods are likely to advance in price. Apart from the fact that stocks are below normal and production away off, production costs have not dropped to any appreciable extent. It is figured that the production costs on lumber for the early part of 1921 will be within 10 or at the most 15 per cent. of those which prevailed last year. What has been gained because of lower wages in the woods, increased efficiency and the general decline in prices, has been offset to a large extent by the unfavorable logging conditions which existed, and the fact that smaller quantities of logs are being brought out. The following figures give an idea of the price of birch on the Toronto market. These quotations are for strictly grade material and must not be confused with grades from which certain stocks have been removed:

4/4 Birch F.A.S.	$130 (unselected for color)
4/4 Birch No. 1 C. & Sel.	80
4/4 Birch No. 2 C	55
5/4 & 6/4 Birch F.A.S.	138
5/4 & 6/4 Birch No. 1 C	95
5/4 & 6/4 Birch No. 2 C	70
8/4 Birch F.A.S.	140
8/4 Birch No. 1 C.	97
8/4 Birch No. 2 C.	70
10/4 & 12/4 Birch F.A.S.	150
11/4 & 12/4 Birch No. 1 C. — Sel.	105
10/4 & 12/4 Birch No. 2 C.	75
16/4 Birch F.A.S.	160
16/4 Birch No. 1 C.	115
16/4 Birch No. 2 C.	85

Maple prices would average from $5.00 to $10.00 lower than the above.

In certain lines, stocks are well up to average, while other items are scarce. On the whole, the stocks of local woods are below the average for this season of the year. In the production end the figures for the winter of 1921 show a startling discrepancy. It is estimated by some, who are in close touch with the woods operations, that the production of softwoods has fallen off from 15 to 25 per cent. and hardwoods from 40 to 50 per cent. There are two reasons for this drop in output. One is that faced with an uncertain demand, in the face of a falling market, the operators did not deem it the part of wisdom to attempt to bring out large stocks on which they might lose money. The other is that the open mild winter, with little or no snow, which we have experienced, has greatly retarded logging operations. In this connection it is likely that many of the small operators, who formerly cut anywhere from 250 M to 750 M, will not produce their usual quota, and those wood users, who have been depending on the smaller sawmills, will have to look elsewhere for part, at least, of their requirements. This is one feature of the lumber situation that many are overlooking.

Imported Woods

The lumber situation might be summed up by stating that there is a feeling in the air that we are just on the verge of better things. The hardwood manufacturers point to the fact that many furniture factories, both in the United States and Canada, which were closed down, have resumed manufacturing on a limited scale, with the probability that production will be gradually increased and that other plans will resume operations. The same holds true in the automobile industry. About 25,000 men were taken on by the various automobile plants in Detroit last week. While this number is only a small proportion of those who were laid off, it tends to indicate the trend of events. The last few weeks have seen an increase in the number of inquiries being sent in and while the buying is extremely light, it is fully expected that the next few weeks will witness a marked improvement and that in another month or two lumber will be moving freely.

This attitude or feeling is reflected to a certain extent in prices, and while it would not be correct to say that prices have stiffened, yet it is felt that they are firmer and that they have been more or less stabilized. In this connection the prediction is made that during the next sixty or ninety days the market will show such an improvement that lumber values will advance on an average of about $5.00 per thousand.

In the producing end there has not been much change. A very small percentage of the mills are running full time, while a few more are operating at part capacity, but the great majority have closed down their plants and taken their men out of the woods. Their attitude is that they do not intend to start manufacturing until the demand improves to such an extent that they will be able to dispose of their output at a price above the cost of production. That time has not arrived as yet. In the meantime the assortment in the different yards and centres is being broken up and stocks are gradually being worn down by attrition or slow buying. It is estimated that an increase in demand amounting to even 40 per cent. of normal would clear out available stocks in short order.

The users of hardwod lumber are in a rather peculiar position for they do not know what the immediate future has in store for them and are therefore not able to estimate their requirements and enter the market. The suggestion might well be made that if a manufacturer figures he will be able to secure business to the extent of $100,000 during the next six months, he should make certain that he has a sufficient stock of lumber on hand to handle such a volume of business. As near as one can judge hardwood lumber will be a very scarce article in the near future. It would appear to be the part of wisdom to cover, at present values, for the possible requirements of spring and summer.

The emery wheel should suit the work to be done. Many wheels caseharden the gullets or burn the teeth. The grade and quality of the wheel is most important.

Small gullets mean slow feeds for the smaller the gullet the greater the resistance of the sawdust.

Canadian Hardwoods

Good Stocks
Right Grades
Prompt Shipments

:: Members National Hardwood Lumber Association :

Crating
of all descriptions

C. A. Spencer, Limited
Merchants and Manufacturers
McGILL BUILDING - MONTREAL

No. 3 Self Contained
Scroll Saw

Colladay Machine Works
Successors to
Jos. O. Colladay Co., Inc.
Manufacturers of a complete line of woodworking machinery
Since 1867 Philadelphia, Pa.

Canadian Hardwoods
for
Canadian Consumers

We offer as follows:

56M′	4/4″	No. 2 C. & B. Basswood
48M′	5/4″	No. 2 C. & B. Basswood
15M′	6/4″	No. 2 C. & B. Basswood
24M′	4/4″	No. 2 C. & B. Brown Ash
100M′	4/4″	No. 2 C. & B. Hard Maple
100M′	4/4″	No. 3 Com. Hard Maple
14M′	8/4″	No. 1 C. & B. Hard Maple
10M′	12/4″	No. 1 C. & B. Hard Maple
17M′	8/4″	No. 2 C. & B. Rock Elm
30M′	4/4″	No. 3 C. & B. Soft Elm
10M′	8/4″	No. 2 C. & B. Soft Elm
20M′	12/4″	No. 1 C. & B. Soft Elm

Also

5/8″ and 1″ Spruce Crating.

Canadian General Lumber Company, Limited
712 Bank of Hamilton Bldg.
TORONTO
MONTREAL OFFICE: 203 McGill Bldg.

Selling
Graves, Bigwood & Co.'s
Lumber, Lath and Box Shooks

Information and Inquiries

You are cordially invited to make use of this department

Users of Dimension Stock

Winchester Sta., N.S., Feb. 4th, 1921.

Editor, "Canadian Woodworker"

Will you kindly give us the addresses of some companies using hardwood square stock, from ½ to 3" square, for the manufacture of spools, bobbins and similar turnings.

Your truly,

J. R. Perry.

Would suggest that you get in touch with such firms as: Canada Spool & Bobbin Co., Walkerton, Ont., Industrial Specialty Mfg. Co., Magog, P.Q., Thompson & Co., Sherbrooke, P.Q., Canada Wood Specialty Co., Orillia, Ont., Lachute Shuttle Co., Lachute Mills, P. Q., and the Otterville Mfg. Co., Otterville, Ont.

Upholstery Filling

Brandon, Man., Jan. 26, 1921.

Editor, "Canadian Woodworker"

Will you kindly tell me where I can purchase tow and moss for upholstering.

Sincerely yours,

Wm. Norris.

The Griffin Curled Hair Co., Toronto, handle tow and moss. Have you ever considered the "Comfy" cushions as manufactured by the "Comfy" Cushion Co., Toronto. Cushions of this type are being used by many of the largest manufacturers of upholstered furniture. They are made in different sizes and shapes as required.

Brass Furniture Trim

Vancouver, B.C., Jan. 27, 1921.

Editor, "Canadian Woodworker"

Where can I buy brass fittings in the old designs suitable for antique furniture? Can you tell me where I could get wood carving tools and machinery.

Yours truly,

The Art Furniture Co.

Foster, Merriam & Co., Meriden, Conn., make a line of brass furniture hardware for the different styles of period furniture. No doubt you can secure your requirements from them. Would suggest that you try either Wood, Vallance & Leggat or McLennan & McFuley, both of Vancouver, for the carving tools. Almost any of the machinery firms advertising in this publication can take care of your machinery requirements.

Polishing Wax for Handles

In regard to the enquiry which appeared in the January "Canadian Woodworker" the National Association of Wood Turners, South Bend, Ind., has sent in the following information:

"We are advised that practically the best wax made for fast polishing and drying on hickory and similar wood, is manufactured by the Fasdura Company, 4725 Ridge Ave., Philadelphia, Pa. Also Strahl and Picsch, 141 Front St., New York City are very large manufacturers of waxes."

Fir and Pine Door Panels

Ottawa, Ont., Feb. 5, 1921.

Editor, "Canadian Woodworker"

Will you tell me where I can secure ⅜" panels for doors, in fir and pine. Thanking you in anticipation, I am,

Sincerely yours,

James Hill.

You can probably secure the stock you want from Hay & Co., Woodstock, Ont., Panels Limited, 1100 Queen St. W., Toronto, The Canadian Western Lumber Co., Fraser Mills, B.C., or the Algoma Panel Co., Algoma, Wis.

Table Catches Wanted

St. John, N.B., Feb. 7, 1921.

Editor, "Canadian Woodworker"

Will you kindly tell me where I can purchase table catches, in brass, for small, round, antique mahogany tables. The catch, which is attached underneath, permits the top to be raised.

Yours truly,

W. A. Kain.

The catches you require are out of the ordinary run of furniture hardware and as such are not made by many of the furniture hardware manufacturers. Would suggest that you try the Hahn Brass Co., Limited, New Hamburg, Ont., Andred Thomson, 246-48 Hope St., Glasgow, Scotland, Grand Rapids Brass Co., Grand Rapids Mich., and Birbieker & Rowland Mfg. Co., Waterville, Conn.

Office Furniture Wanted

A London, England concern is desirous of getting in touch with Canadian manufacturers of office furniture who are desirous of extending their business overseas. Name furnished on request. Inquiry No. 2681.

In Market for Office Furniture

A London company with branches at Paris, Brussels, Buenos Aires, Valparaiso and Santaigo are open to purchase office furniture, more particularly roll-top desks, office chairs and filing cabinets. Anyone desirous of going after this business can secure the name of the firm by writing the "Canadian Woodworker," Toronto, Ont. Inquiry No. 2709.

Desire Piano Agency

A firm in London, England, desire to take up an agency for Canadian pianos. If interested write the "Canadian Woodworker" for the name of the company. Inquiry No. 2683.

Useful Piece of Furniture

A model coffin was the most useful piece of furniture exhibited at a fair at Shreveport, La. A negro boy of sixteen, who works in an undertaker's establishment attends a high school, where he made a number of model coffins in the manual training department. He exhibited one at the fair and won three dollars for the most useful article of furniture shown.

A Complete Stock Is the Best Guarantee of Quick Shipment

ADMITTEDLY under present conditions the full assortment of our hardwood yards is not entirely a question of consideration for customers. At the same time our mills have proceeded according to a well conceived plan in the preparation of mill stocks on hand. The thought has impressed itself upon us during the past few months that the urgency of buyers' requirements warranted giving every possible assistance to meet emergency calls.

The only way this could be accomplished was to know that our stock was not only full, but well assorted. This effort has resulted in our being able to offer at present our usual immediate service on shipments of any kind, grade, quantity or thickness of high-grade quartered oak, gum, cottonwood and other standard southern hardwoods.

Our Four Mills Produce 200,000 Feet Daily

ANDERSON-TULLY COMPANY

MEMPHIS, TENNESSEE

ATCo MEMPHIS SOUTHERN HARDWOOD LUMBER & VENEER

News of the Trade

The Beaver Pattern Works, were recently registered in Toronto.

G. M. Cerini, Montreal, P.Q., have been registered as cabinet makers.

The Sterling Woodworker Co., St. Lambert, P.Q., are erecting a new boiler house.

The Maple Leaf Reed & Rattan Co., 80 West Lodge Ave., Toronto, were recently registered.

The plant of G. H. Thomas & Son, London, Ont., carriage makers, was damaged by fire recently.

The partnership known as the Imperial Upholstering Co., Montreal, has been dissolved and M. Fogul registered as the proprietor.

The mattress factory, operated in Hull, P.Q., by J. B. Larose, was totally destroyed by fire. The loss is estimated at $25,000, with no insurance.

The Canadian Reed & Rattan Mfg. Co., Montreal, P.Q., have been reorganized, and R. P. Larocque is now the registered proprietor.

The Columbia Graphophone Mfg. Co. has been granted an extra provincial license permitting them to manufacture in the province of Ontario.

An attractive two-manual pipe organ was recently completed by Warren Bros. of Woodstock, Ont., for the Neepawa Methodist Church.

G. Guyot, Versailles & St. James St. West, Montreal, contemplates erecting a two-storey factory, 64 x 38, to be used as a carriage factory.

The Montreal Upholstered Manufacturers' Association was recently formed to embrace the upholstered furniture manufacturers of Montreal and vicinity.

St. Maurice Paper Co., Limited, Cap de la Madeleine, P.Q., are erecting a new factory 45x285, two-storey, to be used as a machine and pattern-making shop.

Wood-Turning Products, Limited, Fenelon Falls, Ont., have authorized by supplementary letters patent to increase their capital from $40,000 to the sum of $200,000.

Pembroke Shook Mills, Limited, Pembroke, Ont., have been authorized by supplementary letters patent to increase their capital from $100,000 to the sum of $500,000.

The Sydney branch of Rhodes-Curry, Limited, Amherst, N.S., has been taken over by the well-known woodworking firm of Chappell Bros. & Co., Limited, Sydney, N.S.

The Andrew Malcolm Furniture Company, Limited, Kincardine, Ont., have been authorized, by supplementary letters, patent, to increase their capital from $100,000 to the sum of $300,000.

The next meeting of the Canada Manufacturers' Association is scheduled to be held at Quebec City some time during June. It is anticipated that about 200 delegates will attend this year.

The factory of Armand Bastien at Loretteville, P.Q., was completely destroyed by fire. The loss is estimated at $60,000. The lines manufactured included canoes, snowshoes, skis and mocassins.

The Willis-Lee Motor Co., Marysville, Ont., will begin production in the near future. Some 1500 men will be employed. In this connection a model city has been built to house the employees of this firm.

The box factory operated by M. A. Bradshaw at 1483 Chateaubriand Ave., Montreal, was destroyed by fire recently. The loss is estimated at $75,000. About 100 employees are thrown out of work.

The Victoriaville Furniture Co., Limited, Victoriaville, P.Q., are opening a Toronto warehouse. All orders from Ontario and a large part of the western business will be handled from this point. Mr. Alf. Roberts is to be in charge.

The planing mill of Robert Nicholls, Blenheim, Ont., was recently destroyed by fire. The building and machinery is a complete loss. The owner has not decided whether or not he will rebuild. The loss amounts to $9,000.

The partnership known as the Maple Cabinet & Upholstering Works, Montreal, has been dissolved and the Maple Upholstering Works Reg., registered with George Hammerson as proprietor.

Fisher Body Company of Canada, Limited, Walkerville, Ont., have been granted supplementary letters patents authorizing them to increase their capital from $150,000 to the sum of $2,000,000.

The Rhodes Curry plant of the Canada Car & Foundry Co., Limited, situated at Amherst, N.S., is reported to have been disposed of. The name of the new purchaser is not available.

The Conklin Planing Mill Co., Kingsville, Ont., have secured a suitable building in Kingsville, and are fitting it up as a planing mill. They have also started work on a new office building 25 x 33 feet.

The Kaministiquia Lumber Co., Limited, Fort William, Ont., have commenced work on a planing mill and woodworking factory. It is anticipated that part of this plant will be in operation in about four weeks.

The Godue Casket Manufacturing Co., Limited, Sutton, Quebec, have been incorporated to manufacture and deal in caskets, carts, furniture and wood products. Capital $100,000. G. A. Godue and R. Lariviere, both of Sutton, Que., are among the incorporators.

Ottawa Axe & Tool Company, Limited, Hull, P.Q., have been granted incorporation to manufacture and deal in air and water craft, tools and wood products. Capital $100,000. N. D. Lennen, Ottawa, and J. H. Colton, Montreal, are two of the incorporators.

A. E. Wade, Limited, Sault Ste Marie, Ont., were recently granted a provincial charter to manufacture and deal in flying machines, automobiles and vehicles of all kinds. Capital $150,000. G. Shanks and A. E. Wade, both of Sault Ste. Marie, are two of the incorporators.

Reliance Airless Wheel Company of Canada, Limited, Montreal, P.Q., were recently granted a federal charter to manufacture and deal in automobile wheels, trucks and other vehicles. Capital $100,000. Two of the incorporators are F. Ditchfield and D. J. Perrault, both of Montreal.

London Motors, London, Ont., were recently incorporated to manufacture and deal in automobiles, tractors, flying machines and other conveyances. Capital $1,000,000. W. R. Stansell, manufacturer, and T. A. Conley, both of London are two of the incorporators.

The Wallace Shipyards of North Vancouver, have been awarded a contract to finish the two vessels on the ways of the Prince Rupert Shipbuilding & Drydock Co., Prince Rupert, B.C. Work on these two hulls was stopped when tht latter company went into liquidation some time ago.

C. H. Wills & Co., who have opened a factory at Marysville, a suburb of Port Huron, Mich., to manufacture a new automobile, to be known as the "Wills-Sainte Claire," have acquired a site on the Canadian side of the Detroit River near Sarnia, and contemplate establishing a Canadian factory.

The Government of British Columbia is investigating the possibilities of the new turpentine and resin industry with a view to co-operating with the Douglas Fir Turpentine Co. and providing work for a large number of the unemployed.

Rice Lake Canoe Company, Limited, Cobourg, Ont., have been incorporated to manufacture and deal in canoes, sail boats and other water craft. Capital $100,000. H. R. Lansgslow and J. W. Spragge, both of Cobourg, Ont., are two of the incorporators.

A blaze in the factory of the Knechtel Furniture Co., Limited, Hanover, Ont., recently, threatened the complete destruction of this large plant. Prompt action by the factory fire department confined the damage to one section and kept the financial loss down to about $10,000.

Phonograph Sales Company, Limited, Montreal, have been granted incorporation to manufacture and deal in pianos, phonographs and other musical instruments. Capital $49,900. A. Robert and J. O. Craig, both of Montreal, are two of the incorporators.

The Canadian Libby-Owens Sheet Glass Co., Limited, Toronto, are adding some box manufacturing equipment and are in the market for two cut-off saws, two rip saws, one boxboard printing machine, one No. 12-30 and one No. 16-36 nailing machine.

An associated company of the C. G. Anderson Lumber Co., Limited, Toronto, known as the Anderson Miller Lumber Co., Limited, is being formed to take over the hardwood end of the C. G. Anderson Lumber Co., Limited. This new company will deal altogether in hardwoods.

Automotive Products Co., Limited, Toronto, was recently incorporated to manufacture and deal in automo-

Getting Back to "Normalcy" on the Time Basis

These are serious times—serious for the manufacturer who is content to "sit tight" and wait for "something to break." When that something does break, it is then too liable to be the thing that was not expected. And then what?

But these are also serious times for the manufacturer who is not satisfied with waiting—the man who believes in going after things, who knows that normal times are ahead and is doing everything he can to prepare for them. This is the man we want to talk to.

We are getting back to normalcy, and our progress can be helped. How? Production! Time conservation! When you purchase an hour of an employee's time, it is up to you to get it. You are entitled to it, and the employee is willing—even anxious—to give it. Have you done your part?

International Time Recorders, when properly located, check the wasted time between entrance and work-bench.

International Job Time Recorders give you an accurate time cost for each operation the workman performs.

The result—sixty minutes working time for every hour of every employee's time and greater production.

—And a quicker return to NORMALCY.

This is our Card Type Time Recorder —showing a fully Automatic Model. For some factories it is preferable, but in others possibly our Drum Type is better. Which is yours? Let's get together and figure it out.

International Business Machines Company, Limited

F. E. Mutton, Vice-Pres. and Gen. Mgr.

Head Office and Factory

300-350 Campbell Avenuue

TORONTO - ONTARIO

HALIFAX, 44 Granville St. ST. JOHN, 18 Germain St. QUEBEC, 501 Merger Bldg. MONTREAL, 1 and 3 Notre Dame St. OTTAWA, 190 Queen St. TORONTO, 409½ Yonge St. HAMILTON, 228 King St. E. LONDON, 489 Richmond St. WALKERVILLE, 44 Lincoln Rd. WINNIPEG, 227 McDermott Ave. VANCOUVER, 110 Water St.

Also manufacturers of International Dayton Scales and International Electric Tabulators

bile, boats, aeroplanes and ohter vehicles. Capital $100,000. W. E. Summerville and L. A. Richard, solicitors, both of Toronto, are among the incorporators.

The plant of the Woltz Moulding Co., Limited, Toronto, was recently damaged by fire. The blaze centered in the finishing room and is supposed to have been started by a defective wire. The loss is confined largely to the destruction of stock, as the equipment was practically uninjured.

The Kitchener-Waterloo Manufacturers' Association recently held their annual meeting. The Board of Directors for 1921 is as follows: F. S. Hodgins, G. H. C. Lang, G. Valentine, A. S. Capwell, N. M. Davison, E. J. Bauer, R. A. McGillivray, E. W. Clement, J. H. Kennedy, W. E. Woelfle and J. Baetz.

A large quantity of valuable furniture was destroyed in a fire which damaged the residence of Major D. N. Matheson, New Toronto, Ont. This furniture consisted of a number of family heirlooms which have been in the family for generations and which were valued at $40,000. These cannot be replaced.

The Sterling Woodworking & Construction Co., of St. Lambert, Que., whose premises were destroyed by fire on November 20th last, have nearly completed re-building and expect to be in operation by the end of February. This firm will be manufacturing sashes and doors, interior finish and general mill work.

T. B. Rivett, reeve of Niagara township, is endeavoring to organize a company to start a basket factory at Niagara-on-the-Lake. An effort is being made to interest the fruit-growers who were so seriously handicapped by the shortage of baskets last season. Nothing definite has been decided as yet.

Monsarrat Machinery & Foundries, Limited, Riviere du Loup, P.Q., have recently been incorporated to manufacture and deal in woodworking, pulp mill and other similar machinery. Capital $80,000. C. A. Monsarrat and M. H. Monsarrat, both of Riviere du Loup, are two of the incorporators.

The manufacture of furniture in Mexico has made vast strides during recent years. Period styles are being produced from Mexican woods, which compare favorably with the finest products of our best factories. At the present time a large part of the local trade is being supplied by the Mexican plants.

The Bridgeburg Shipyards of the Canadian Allis-Chalmers Co. have been closed down for an indefinite period. This will be a serious blow to Bridgeburg, as the annual payroll of this plant approached the half million mark. The present status of the shipbuilding industry is the reason given for stopping operations.

The factories of the Waterloo Furniture Co., Waterloo, Ont., and the National Furniture Co., Kitchener, Ont., which were recently taken over by E. O. Weber, Limited, Waterloo, Ont., have resumed operations. The Waterloo concern is now working on a piece-work basis, while the National Furniture Co. is working 10 hours a day at the rate paid for 9 hours.

An interesting little book entitled "Industrial Injuries and Their First Aid Treatment," is being distributed with the compliments of the Denver Chemical Co., Denver, Col. This treats with the different accidents which are liable to occur in any industrial plant, and outlines how they should be treated. A copy of this booklet may be had by applying to the Denver Chemical & Mfg. Co.

The new furniture factory of the Langslow's, Limited, H. Lovell & Sons, Limited, Coaticook, Que., have been granted a provincial charter to conduct a general lumber business and to manufacture chairs and other articles of furniture. The company will take over the real estate business of H. Lovell & Sons. Capital, $25,000. Fritz E. Lovell, lumber manufacturer, and A. J. Sparks, lumberman, both of Coaticook, are two of the incorporators.

Cobourg, Ont., is rapidly nearing completion. The equipment is all in hand and is being installed as rapidly as possible. Recently part of the plant was set in operation and about twelve given work. This number will be added to as rapidly as possible. Owing to the present depression the company are receiving many applications for work.

The Associated British Industries of Canada, Limited, recently adopted a new constitution. The Association has been operating branches both in Montreal and Toronto, but it has been decided to operate under one official head so as to secure closer co-operation between the two branches. G. A. Marshall, is president of this organization with Capt. John Harris vice-president, and W. E. Bunny, secretary.

An effort is being made to arrange a joint meeting of the Retail Merchants' Association, the Canadian Manufacturers' Association and the Wholesalers' Association. Should this be brought about, one important question, which would be discussed, is the best policy to adopt in order to assist in the campaign for furthering the sale of Made-in-Canada goods, and also the policy which should be adopted in order to swing the balance of trade back in favor of Canada.

Several of the Owen Sound furniture manufacturers have started their plants again. The Owen Sound Chair Co., Limited and the North American Furniture Co., Limited, are running with reduced staff, employing about one hundred men. The North American Bent Chair Co. recently took on about seventy-five hands. It is anticipated that the demand for furniture will gradually increase and that it will not be long before these plants are operating with full staffs.

Announcement was made in a recent issue of the "Canadian Woodworker" that the Canada Barrels & Kegs, Limited, Waterloo, Ont., had been incorporated with a capital of $500,000, to take over the cooperage business known as the "Chas. Mueller Co., Limited," Waterloo, Ont. The officers of the new company are: President, E. F. Seagram; 1st vice-president, T. W. Seagram; 2nd vice-president, Norman Seagram; general manager and secretary-treasurer, Leo Henhoeffer; assistant secretary-treasurer, J. B. Salm.

Certain of the large B.C. mills recently lost a good order for box shooks because they could not or would not meet the prices quoted by their American competitors. The order which was for 5000 tons of box shooks, was offered to Vancouver first, as the Australians preferred dealing with Canada if they could get as good a price as the United States mills offered, but the British Columbia mills refused to accept a loss on high-priced logs of last summer and fall markets, despite the fact that logs are now much cheaper.

M. S. Snyder, manager Waterloo Broom & Brush Co., recently stated that it is extremely unlikely that the price of brooms will go any lower. There is a shortage of corn which means that the price of this material will be maintained, while the advance in freight rates has hit the broom manufacturers both coming and going. The price of handles advanced about 75 per cent. during 1920, and has declined only about 10 per cent. It has been intimated that prices on all lines of broom handles will advance in the near future. Taking it all around, it is hard to see how broom values can be lowered to any extent.

The plant of the Beamsville Basket & Veneer Co., Beamsville, Ont., was recently destroyed by fire. The loss, which is a heavy one, amounts to $40,000, and was covered only to the extent of $11,000 by insurance. The orders on hand have been distributed among other Ontario basket factories so that the fruit growers in its district will not suffer any inconvenience because of a shortage in baskets. A. W. Reid, Jr., son of the owner, is responsible for the statement that building operations will be commenced at as early a date as possible, and it is hoped that the new plant will be in operation some time in July.

The woodworking plant recently completed at Upper Cross Creek, N.B., by Gordon C. Scott, was entirely destroyed by fire. The loss amounts to $25,000, with $6,000 insurance. This plant was formerly a sawmill, but had just been remodelled and equipped with box-making and shingle-manufacturing machinery. Operations were to have started the day of the blaze. The owner has decided to rebuild and it is expected the new plant will be completed and in operation by May 1st. In addition to a complete line of box-making equipment, Mr. Scott contemplates installing shingle-making machinery, together with four rossers.

Personals

S. F. Rutherford, managing director of the Dominion Box & Packing Company, Limited, Montreal, has been elected an alderman for the City of Westmount, P.Q.

R. A. Laidlaw of the R. Laidlaw Lumber Co. (Ltd.), Toronto, lumber dealers and general woodworkers, and Mrs. Laidlaw left recently on a visit to China. They expect to return about April 1.

A. K. Johnson, Toronto, Ont., has been appointed Canadian representative for Mowbray & Robinson Co., Inc., of Cincinnati, Ohio, manufacturers of hardwood lumber. Mr. Johnson recently returned from a trip to Cincinnati, where

One reason why our Gum is Straight and Flat

Do You Know

"That you can get Gum Lumber that is **free from stain and as bright as a dollar?**

"Always thought the sap part of Gum must be discolored, didn't you? Some boards black, some a lighter shade, a few bright—**all lacking uniformity?**

"Oh! of course, the inspection rules say "stained sap is no defect," **but what do you say Mr. Manufacturer,** you who have to **cut up, work and finish the lumber?**

"We have never believed that a manufacturer of furniture, trim, finish, etc., could satisfactorily use Gum lumber in the shape it is generally put out, and we, therefore, set out to **eliminate** the **objectionable features** we have mentioned.

"Have we succeeded? **Unqualifiedly yes.** Nothing left to chance, **no guess work.**

"Every board of our KRAETZER-CURED Sap or Quarter Sawn Unselected Gum **is bright,** with a slight pinkish tinge closely resembling cherry, and **uniform throughout.**

"And it's straight and flat too, **that's another thing we've done.**

"Get acquainted with our kind, **you'll never be satisfied with the other kind again.**

"Costs only a little more in the beginning and **the final cost is less, very much less** and oh! the **satisfaction, the freedom from trouble and worry.**

"Don't be deceived by misrepresentations. Insist on the genuine. Every board bears our trade mark.

Our protection THE KRAETZER-CURED LUMBER CO. *Your guarantee*

The Kraetzer-Cured Lumber Co.

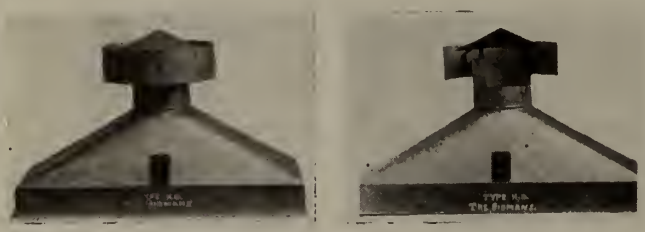
GENERAL OFFICE: GREENWOOD, MISS.

Band Mills: Greenwood, Miss., Moorhead, Miss.

Why our Gum does not stain

Our Quartered and Plain Red and White Oak, Ash, Hickory, Red Gum and Tupelo are as fine as the highest quality of virgin timber and thorough knowledge of production can produce. THERE IS NONE BETTER.

Type A, or an active lifting vent head. For drawing fumes, dust or smoke out of rooms, or over forges and vats. Made from 4 in. across throat up to any size desired.



Our N-D Type, or the head that POSITIVELY PREVENTS ANY DOWN DRAUGHT. This head is the secret of the UNIFORM VENTILATION in

The Sidman Lumber Curing Kiln

Also suitable for cooling sheds, varnish rooms, lofts, and is a SURE CURE FOR SMOKY CHIMNEYS. Made from 8 in. across the throat up to any size.

Any style or size base for either type. Prices upon application.

The Sidmans of Canada

Heating and Ventilating Engineers and Lumber Curing Specialists. ::

LONDON CANADA

he familiarized himself with the manufacture of the different woods.

C. O. Maus of the Hyde Lumber Co., South Bend, Ind., has written to a number of his friends in Toronto, stating that his company has decided to absorb the exchange on all new business in connection with Canadian trade.

George C. Heintzman, Toronto, of the well-known firm of Heintzman & Co., piano manufacturers, recently won the gold championship in the annual South Florida Golf title tournament, which was played on the Palm Beach Club green.

Frederick Arnold Farrar, who, for the past fourteen years, has directed the advertising of the Adams & Elting Co., Chicago, Ill., manufacturers of finishing materials, has been appointed advertising director for the Greater Glidden Co. He will continue in charge of the advertising of the Adams & Elting Co., as well as look after the publicity of the other divisions of the Glidden Company.

Obituary

Alex. Tisdale, a well-known boat builder of Belleville, Ont., recently passed away.

Napoleon Piche recently passed away at his home in Sandwich, Ont. Mr. Piche was a partner in the firm of Piche & Genet, carriage builders.

George Morrisette, Granby, P.Q., was recently killed in the plant of Wilfred Charron. His death was caused by the breaking of a shaft permitting a heavy pulley to fall, striking him on the head.

John Smithson, Collingwood, Ont., recently passed away. Mr. Smithson conducted a cooperage at Thornbury for a number of years and latterly moved to Collingwood where he took charge of the keg mill of the Imperial Steel & Wire Co., Limited.

Canadian Toy Industry Unequal to Demand

Although the toy and doll industry of Canada has made considerable advance compared with pre-war times, it would appear from official statistics that the domestic demand is by no means fully met by Canadian factories, for the Dominion's imports of toys and dolls during the fiscal year 1913 amounted to $939,678 and during 1920 to $1,534,728.

The kinds of toys manufactured in Canada include animals, autos, balls, billiard games, boats, building blocks, carriages, crockinole boards, croquet sets, dishes, dolls' furniture, games garden sets, lawn swings, pool tables, pucks, rocking horses, skipping ropes, sleighs, teeters, toy balloons, tricycles and wheelbarrows, which are made of celluloid, chamel, iron, steel, tin, rubber and wood. The growth of the Canadian industry is principally due to conditions arising out of the war, and at the present time some thirty-five toy factories are listed, although the census returns report the operation of only fifteen in 1918—the latest year for which figure are available. These fifteen factories represented a capital investment of $369,219 in 1918; they employed thirty-three salaried workers and 193 wage workers, to whom they paid, respectively, $44,190 and $131,817; they used materials costing at the works $115,329 and turned out products whose selling value at the works was $405,369.

As already stated the Dominion required in the lasts year an additional $1,500,000 worth of toys to supplement the output of Canadian factories. Before the war Germany was the chief source of supply, but the United States now occupies first place, and Japan, likewise, has made a notable advance in its shipments of toys.

When there is a blue haze and a smell of smoke around a saw bench it is a sure sign that the saw teeth want grinding fairly hard on the front.

LUMBER OF QUALITY

Rightly Graded - Promptly Shipped - Attractively Priced

4/4 to 16/4	White & Black Ash
" " 12/4	Basswood
" " 16/4	Birch
" " 16/4	Beech
" " 12/4	Hard Maple
" " 12/4	Soft Maple
" " 16/4	Oak
4/4	Butternut

The above stock is in pile in our transit yard, Toronto, and is bone dry and well manufactured and can be shipped immediately.

C. G. Anderson Lumber Co., Limited

705 Excelsior Life Building Toronto

H.W. PETRIE LIMITED

Canada's Premier Machinery House

Everything in Machine Shop Equipment

Everything in Machine Shop Supplies

Our Stock of Woodworking Machinery Includes:

DOWEL MACHINES	MOULDERS	SAW ARBORS	PLANERS & MATCHERS
DOVETAILERS	MORTISERS	SAW TABLES	DRAG & SCROLL SAWS
BAND SAWS	PLANERS	TENONERS	BAND SAW FILING CLAMP
BAND RE-SAWS	SHAPERS	TRIMMERS	HORIZ. & POST BORERS
BAND SAW ROLLER	SWING SAWS	TIMBER SIZER	WOOD SCRAPERS

Let us Quote on Your Requirements

H. W. PETRIE, LIMITED, 131-147 Front Street West Toronto

General Woodworking Trade Mart

Quick Action Section

Equipment Materials Employment

Veneer Lathe Wanted

Good second-hand veneer machine.
Write J. Stanley Wedlock, Charlottetown, P. E. Island. 1-3

FOR SALE

Berlin Triple Drum Sander, 48".
Fay & Egan Drum Sander, 48".
Berlin Triple Drum Sander, 43".
McDonough 54" Band Resaw, Vertical
Diamond Horizontal Band Resaw.
American Timber Sizer.
70" Sheldon Fan.
400 H. P. Cross Compound Corliss.
Write Box 82, Canadian Woodworker, Toronto. t.f.

I Offer the following

Used Machines

For Immediate Shipment

Subject to prior sale

Sticker, Hermance Machine Co., 10", 4 Side.
Moulder, Hall & Brown 12", 4 Side.
Moulder, Greenlee Bros., 6", 4 Side.
Moulder, American, 10", 4 Side.
Sandpapering Machine, Berlin, 48", 3 Drum.
Sander, Endless Bed, 42", H. B. Smith.
Sandpapering Machine, Berlin 36", 3 Drum.
Belt Sander, Curtis, No. 20.
Sandpapering Machine, Moore Machine Co., Double Belt.
Belt Sander, Shimmel Simplex.
Belt Sander, Simplex Double Edge.
Scraper, Baxter D. Whitney, 42".
Rubbing Machine, Moore Machine Co., Standard.
Matcher, American, No. 229, Fast Feed Hardwood Flooring.
Matcher, American, No. 22, 24", 4 Side.
Rip Saw, Greenlee Bros., Power Feed.
Band Resaw, Connell & Dengler, 60".
Band Resaw, Mershon, 44".
Band Rip Saw, American No. 1, Power Feed.
Circular Saw Mill, Hoosier Pony.
Jointer, Falls Machine Co., Undercut, 24", Power Feed.
Buzz Planer, 24", Buss Machine Works.
Lathe, Back Knife Clement, 36".
Planer, Buss Machine Works, 30" Cabinet.
Planer, Whitney, 24" x 6", Single.
Dowell Rod Machine, E. B. Hayes.
Dowell Gluer and Driver, E. B. Hayes.
Door Clamp, E. B. Hayes, Standard Power.
Shaper and Dove Tailing Machine, Combination Single Spindle.
Carving Machine, Moore, 4 Spindle.
Lock Corner Machine, Morgan Machine Company.
Drills, Tool Room Buffalo Forge Co.

C. J. ANDERSEN,
t.f. 15 W. Swan St., Buffalo, N.Y.

Maple and Birch Squares for Turning

Handle & Dowel Stock, etc.
Furniture Dimension stock cut to order.

M. E. DAVIS,
11-2 Arundel, Que.

FOR SALE

Planing mill on the Canadian National Railways, between Levis and Mont Joli, doing a Milling in Transit business, with work ahead guaranteed for several months at profitable prices. Fully equipped with Planer, Sticker, Resaw and Ripper, handling several cars daily, with siding capacity of nine cars, right in the heart of lumber section of this Province, where more than ten times mill's capacity has been refused during the past year. Mill built of Cement with Cement Floor, Asbestos Roof, with additional buildings for Sash and Door factory or box factory, and sheds for piling dressed lumber, also with piling ground for about half a million feet of lumber. Price $30,000.00 on terms that will be satisfactory. A live man or group of men can easily clean up $2,000.00 per month net profit, and mill can be extended for increased business very easily. Principals only. If interested write to Box 106, Canadian Woodworker, Toronto, Ont. 1-3

Walnut Maufacturers to Continue Publicity

The annual meeting of the American Walnut Manufacturers Association was held at the Association offices in Chicago on Thursday, January 20. The point of principal importance is the decision to continue publicity in behalf of walnut. The decision was based on the very satisfactory record made by the campaign during the past years. Members were much gratified by the apparent public interest in walnut manifested directly through the increasing showing of walnut goods at the furniture market at Grand Rapids and Chicago. The efforts of the Association to increase interest in walnut have centered largely about the necessity for convincing the public that the walnut supply is adequate to meet present and future requirements. Already the growing call for walnut furniture has resulted in quite extensive installation of walnut interiors in pretentious public buildings of all kinds.

Bargains in Used Machinery

Subject to prior sale.

YATES No. 341 Band Resaw with bevel gear drive, loose pulley and complete filing tools.

WOODS 15 x 6" Planer and Matcher.

WOODS 24 x 6" Planer and Matcher.

YATES 30 x 6" No. 160 Double Surfacer, rebuilt and warranted as good as new.

MACGREGOR Double Surfacer 28 x 6 with extra set of knives.

YATES No. 87 Hardwood Planer and Matcher.

MISCELLANEOUS

MacGregor Mortiser
C.M.C. Buzz Planer
C.M.C. 6" Sash Moulder
Crescent 18" Surface Planer
MacGregor Tenoner
C.M.C. 12" Moulder
MacGregor Dowel Machine
C.M.C. Blind Mortiser
Rogers Saw Sharpener (New)
C.M.C. Glue Jointer

M. E. Casey Co.
Limited
263 St. James St., Room 801
MONTREAL

By-Laws
Noble Order of Gloom Chasers
Long-Bell Conclave

1. The purpose of this organization is the elimination of Old Gus Gloom.
2. The membership is limited to one hundred million, that being a conservative estimate of the population of this country at the time of writing.
3. Any man, woman or child, with eyes to see signs of prosperity and ears to catch a note of optimism, is eligible to membership, and becomes a duly accredited Gloom Chaser upon signing the regular membership blank and thereby promising actively to support the order and its intent.
4. Note the Word "active." From the moment of swearing "So help me Gloom Chasers," a member in good standing must chase gloom wherever he meets it—whether it be on the street, in office or workshop conversations or by grace of the stranger that is within thy gates. Further, he must promote the movement by giving to his official publication, or to local newspapers, any signs of prosperity he may see or hear.
5. Any member failing to carry out the above provisions is liable to the extreme penalty—to be swallowed by .gloom .and .plunged into eternal gloominess—or to be suspended for an indefinite period from fellowship with brother Gloom Chasers, or to be punished as his local conclave may direct.
6. Any member seen in company with Old Gus Gloom, upon whatever pretext, may be suspended for an indefinite period.
7. Any member acknowledging membership in or relations with or sympathies for any pessimists' club, gloom club, sob society or other movement with similar purpose hereinbefore or hereinafter organized may be taken before a firing squad armed with the poisonous gasses of pessimism at any beautiful, optimistic sunrise and summarily dealt with as hereinafter prescribed.
   (a) The fallen brother shall listen for half an hour to a reading from the Pessimists' Handbook, after which shall be played a funeral dirge. He shall be blindfolded so that by no chance will he see nature's optimistic face. So that he may contaminate no other person or thing he shall be caused to cry aloud, "I am the leper of pessimism," and the gibes of all true brothers of the Noble Order of Gloom Chasers shall greet his cries.
   (b) Only upon proper penitence and promises for the future shall this fallen brother be reinstated.
8. The dues for membership in daily activity as the conscience of the Gloom Chaser may dictate. There are no paid-up memberships. The dues are never paid. Look at each day and chase its gloom.

Keeping Water in Barrels from Freezing

While the use of water barrels and buckets may possibly not be the best and most efficient method for fire protection, nevertheless there are places where such equipment offers the only practical means of safeguarding a plant from fire. In getting the barrels ready for the winter they should be overhauled and put in good condition. In the first place it is best to use all-wood barrels with wood hoops,. as metal barrels, or wood barrels with metal hoops, give out very quickly under the corrosive action of the chemicals used to lower the freezing point of the water. It is an excellent precaution to paint the barrels well inside before they are used in the fall, and in fact this is necessary where calcium chloride is used to prevent freezing. In sections where temperature of only a few degrees below zero, Fahrenheit, is to be expected, sodium chloride, or ordinary salt, will give satisfactory results. Where very much colder weather is expected, calcium chloride can be used to good advantage and is not very expensive. Both sodium chloride and calcium chloride should be dissolved in the water before putting the solution into the barrels, as it takes considerable physical exertion to dissolve the salt, especially as the solution nears saturation. The following table gives the amount of calcium chloride and sodium chloride to use and the approximate temperature at which the solution may be expected to freeze:

Amount in pounds per gallon of water	Degrees below zero (F.) when calcium chloride is used	Degrees below zero (F.) when sodium chloride is used
½	20°	29°
1	27°	18°
1¼	25°	15°
1½	23°	12°
1¾	21°	9°
2	18°	6°
2¼	14°	3°
2½	3 to 4°	-1°
3	-8 to 4°	-3°
3½	-8 to 11°	*-8°
4	-17 to 19°	...
4½	-27 to 29°	...
5	-39 to 41°	...
5½	-50 to 54°	...

*At 3½ pounds to the gallon the sodium chloride solution becomes saturated and it is useless to add more sodium chloride.

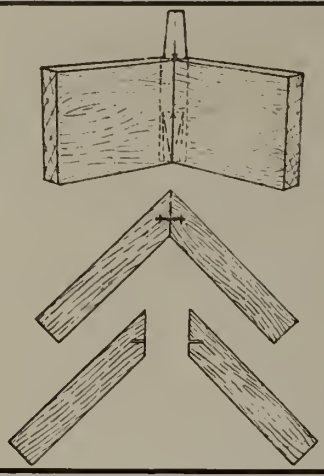
Woods Used for Toys

Wood holds its high place in the toy industry, not because it is so much cheaper, but because articles of large size would be too heavy if made of metal, and if of sheet metal, there is danger that the rough edges would cut the hands of the children. Many articles such as sleds, are made of wood because it is the best material, irrespective of cost or weight.

An idea of the amount of wood used annually for toys in the United States is given in the following table:—

	Feet Used
Basswood	8,739,242
Maple	3,964,400
Beech	3,221,506
Birch	3,221,506
White Pine	2,367,131
Elm	2.042,055
Oak	1,444,057
Chestnut	966,268
Ash	895,300
Yellow Poplar	882,000
Red Gum	523,000
Cottonwood	257,000
Hemlock	241,000
Cypress	150,000
Sycamore	91,343
Butternut	10,000
Tupelo	5,000
Cherry	2,000
Spruce	1,300
Total	28,926.552

This comparatively large consignment of wood might be quite a drain on our forests if it were not for the fact that much of the wood used in toy-making would be scrapped if not employed for this purpose. Toy-making is a good means of utilizing waste products.



The "Steelgrip"

METHOD IS THE BEST

for making mitered, butt or any other joint.

SAVES—Time, Labor and Money

PRODUCES—Economy and Durability

Used by all leading Furniture, Cabinet and Casket Manufacturers, for sale by dealers in Cabinet Hardware, or direct if you so prefer.

Clamp Nail Company 4532 PALMER ST., CHICAGO

CIRCULARS and SAMPLES ON REQUEST

DO YOU KNOW

THE SIGNODE WAY

IS

THE SENSIBLE WAY

THE SUCCESSFUL WAY

THE SATISFACTORY WAY

OF

STRAPPING YOUR SHOOKS, VENEERS, MOULDINGS, AND BUNDLES OF LUMBER FOR SHIPMENT

LET US SEND YOU FULL DETAILS

SIGNODE SYSTEM, INC.

TORONTO 16 COLBORNE ST.

MONTREAL 20 ST. NICHOLAS ST.

CHICAGO NEW YORK BOSTON ATLANTA SAN FRANCISCO

STRAPPED SHOOKS READY FOR SHIPMENT

THE CHICAGO MIRROR AND ART GLASS COMPANY

Manufacturers of

RELIABLE MIRRORS

AND

PLATE GLASS TOPS

Send your specifications to us at

216 NO. CLINTON ST., CHICAGO, ILL.

Steel Clamp Nails

The best labor saving device made, for making mitered joints for Furniture, Cabinet, Table, Phonograph and Casket Manufacturers.

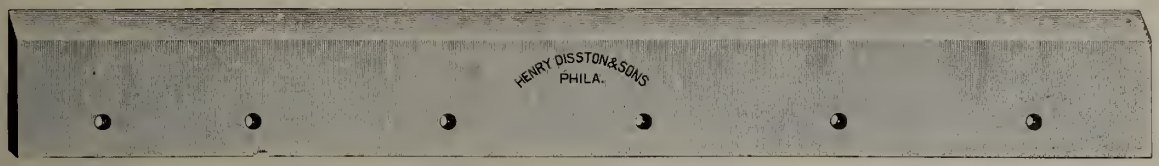
Write for samples and prices.

Wm. Siegler & Son

115-117 S. Clinton St. CHICAGO, ILL.

DISSTON

ALL STYLES OF KNIVES FOR WOODWORKERS



Are you getting the maximum production from your knife equipment? With the present necessity for greatly increased production, be sure your knives will give you the best possible results.

Disston knives cut fast and clean ,and hold their cutting edge.

Write for the Disston booklet on Machine Knives.

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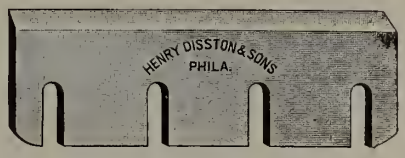

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Inserted Tooth Saws
Solid Tooth Saws
Shingle Saws
Lath Saws
Special Grooving Saws
Dado Heads
Band Saws
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"Crowell" Swages and Shapers

Maple Leaf Saws are made by the largest All-Canadian Saw Manufacturers

Shurly-Dietrich Co.
LIMITED
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GRAND RAPIDS VAPOR KILN

used by

Kindel Bed Co. — Jacques Furniture Co.
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A kiln built up to a standard—not down to a price.

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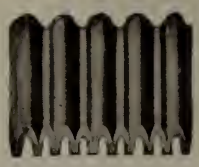

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PLAIN EDGE

According to final decision, after long litigation, we have been granted the SOLE RIGHT to manufacture a Saw Tooth Corrugated Fastener with a continuous cutting edge. Our fastener is beveled evenly on both sides, which enables fasteners to be driven in straight, and much easier than any other fastener made. Our Corrugated Fastener is made in various widths and corrugations, also in coils wound right and left. Try our products and you will use no other.

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Manufacture the Best
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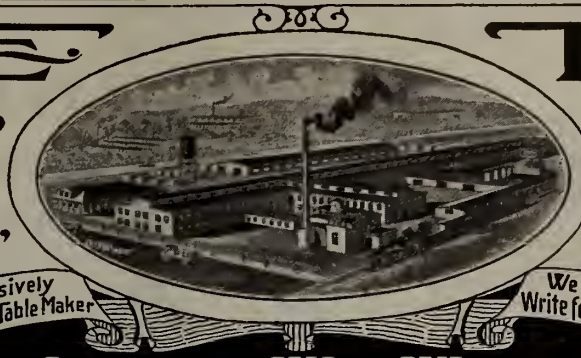

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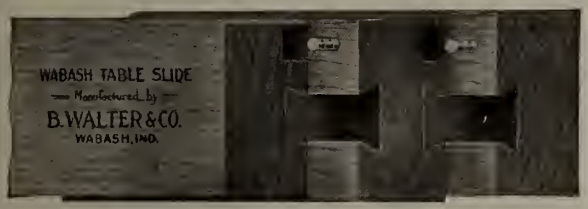

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Wabash Slides insure Satisfied Customers

SLIDE MAKING is a SPECIALTY BUSINESS

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The Productimeter

It depends on how well you guess. But you're apt to waste a lot of time and money if you guess when it's so easy to know.

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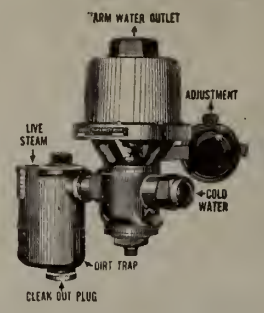

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Cast Brass Leg Sockets

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No.	Opening at Top inches	Height inches
A808	1	1
B808	1¼	1¼
C808	1½	1¼
D808	1¾	1½
E808	2	2
F808	2¼	2¼

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No.	Opening at Top inches	Height inches
A814	1	⅞
B814	1¼	1
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Also in wrought brass, either straight or tapered

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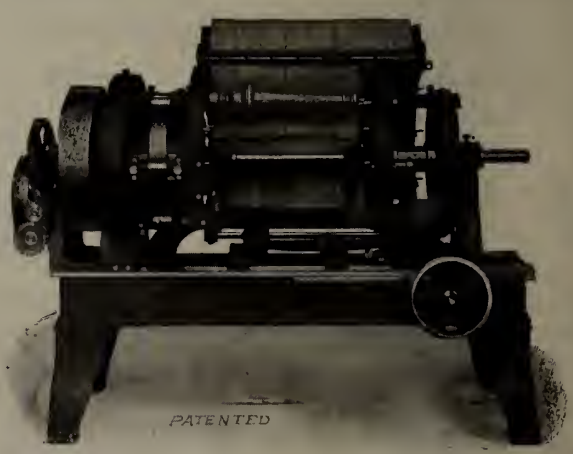

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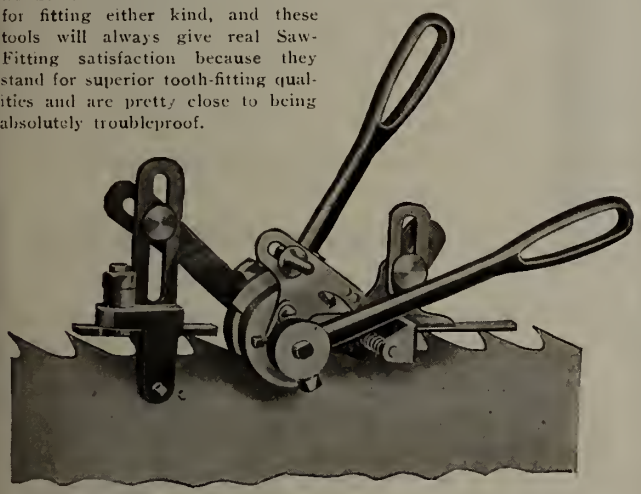

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Same time; change your paper in 5 minutes.

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Satisfied users are saving over 25 per cent. of sandpaper with the Loeffler Drums.

Sizes in 9, 16 and 20-in. diameters, 24 to 36-in. face.

We also build interchangeable close-joint drums to fit your drum arbors.

Edge belt sanders—Belt sanders—Drum sanders. It will pay you to investigate.

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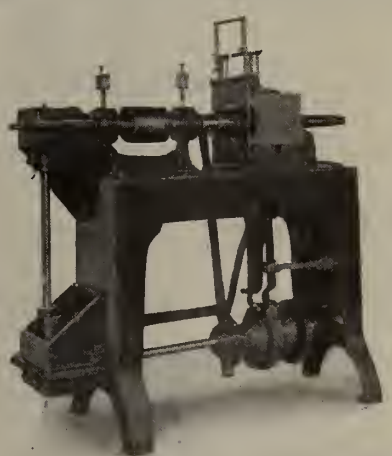

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Fits every grip without a slip and takes a tighter hold with less effort. It is a tool of real economy and a clamp that insures efficiency.

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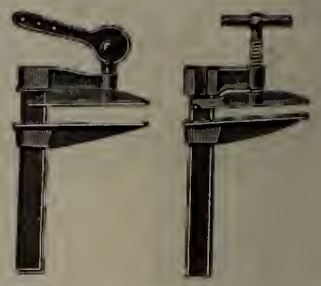


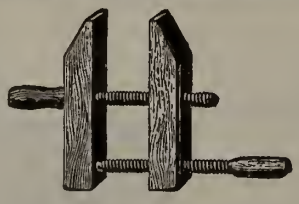
Colt's Universal and Vise Clamps are unsurpassed for the Furniture Manufacturer and General Woodworker. They are made right, both in design and quality of materials and workmanship.

Colt's Clamps are quick-acting and have broad jaw clamping surface.

For further information write for Catalogue No. 294.

Batavia Clamp Co.

235 Centre St. **BATAVIA, N. Y.**



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Manufactured by

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ALL STEEL
CLAMPS

For Immediate Delivery

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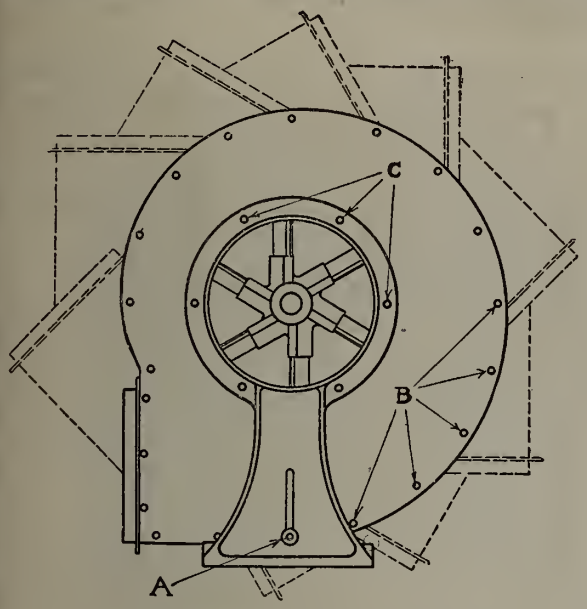
TORONTO

Reversible Housing



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By this arrangement one fan may be used to meet all requirements, thus eliminating crossed belts and sharp angles.

Let our engineering department help you plan your refuse exhauster system.

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Temperature of wet and dry bulbs should be maintained in substantially the same relation all over the kiln.
A variation of 5° will produce as much as 14% difference in humidity, when high humidities are being carried.

NATIONAL ENGINEERS HAVE SOLVED THIS AND OTHER DRYING PROBLEMS.

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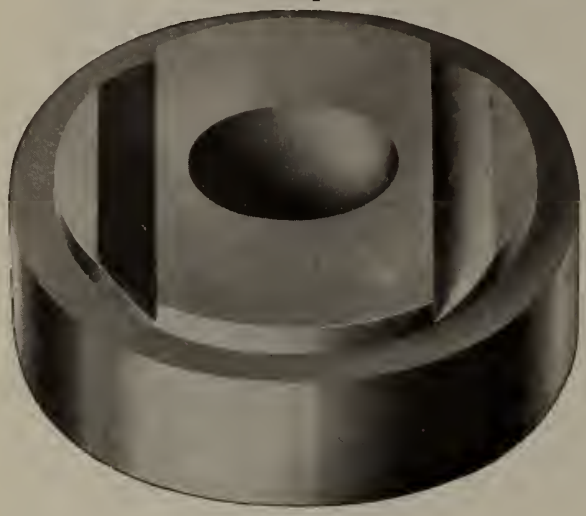
Ball Bearing Shaper Guide Collars

A Decided Improvement Over the Revolving Solid Collars Now in Use



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Ball-bearing Shaper Guide Collars are made with grooves as shown, for flat knives, and without grooves for solid steel cutters.

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The friction set up by stock or patterns bearing against solid revolving collars is entirely eliminated when ball-bearing shaper collars are used. Every shaperman knows the effect of this friction on stock being run, and so will appreciate the real value of these new shaper collars.

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Celluloid Zapon Co., New York.

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Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

EXHAUST FANS
Canadian Blower & Forge Co., Kitchener, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.

EXHAUST SYSTEMS
Canadian Blower & Forge Co.
Neville Cooper Co., Toronto

FIBRE CORD
Grand Rapids Fibre Cord Co., Grand Rapids.

FLOORING MACHINES
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

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Eagle-Ottawa Leather Co., Grand Haven, Mich

FURNITURE TRIMMINGS
Foster, Merriam Co., Meriden, Conn.

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GRAINING MACHINES
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Fay & Egan Co., J. A., Cincinnati, Ohio.
Yates Machine Co., P. B., Hamilton, Ont.

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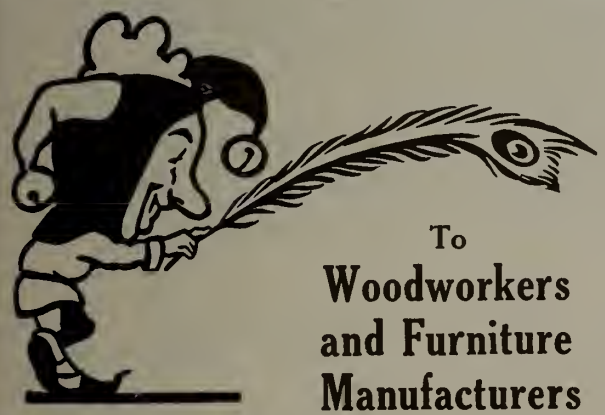

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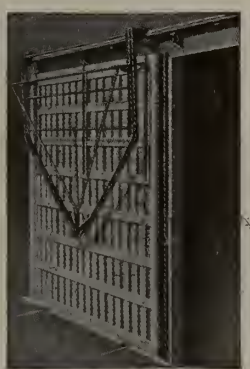

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Pringle, R. E. T., Toronto, Ont.

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Jackson, Cochrane & Company, Kitchener, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GLUE SPREADERS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener.

GLUE ROOM EQUIPMENT
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Fay & Egan Co., J. A., Cincinnati, Ohio.
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Williams Machinery Co., A. R., Toronto, Ont.

GRINDERS (Knife)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

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Fay & Egan Co., J. A., Cincinnati, Ohio.
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Carborundum Co., Niagara Falls, N.Y.

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Mattison Machine Works, Rockford, Ill.

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Steele & Hibbard Lumber Co., St. Louis, Mo.
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Anderson-Tully Co. Memphis, Tenn.
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Arrow Lumber Co., Parkersburg, W. Virginia
Atlantic Lumber Company, Toronto, Ont.
Bacon Lumber Co., Cleveland, Ohio.
Banning, Leland G., Cincinnati, Ohio.
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Powe Lumber Co., Thos. E., St. Louis, Mo
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Rush Lumber Co., Memphis, Tenn.
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Sondheimer Co., E., Memphis, Tenn.
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Stark & Co., Jas. E., Memphis, Tenn.
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Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
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Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

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Jackson, Cochane & Company. Kitchener. Ont.
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Preston Woodworking Machinery Company, Preston, Ont.
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Peter Hay Knife Company, Galt, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont

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Hart Mirror Plate Co., Grand Rapids, Mich.

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Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.

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Roberts, Geo. G., Chicago, Ill.
Waetjin & Co., L., Milwaukee, Wis.

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Cowan & Company, Galt, Ont.
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Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
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Casey Co., M. E., Montreal, Que.
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Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLANING MILL MACHINERY
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PORTABLE DRILLS
Wisconsin Electric Co., Wisconsin, U.S.A.

PRESSES (Veneer)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Jackson, Cochrane & Company, Kitchener, Ont.
Perrin & Co., Wm. R., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

REED
Carter & Co., E. T., Toronto, Ont.
Overseas Reed and Cane Co., Ionia, Mich.

RESAWS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

RIM AND FELLOE MACHINERY
Defiance Machine Works, Defiance, Ohio.
Fay & Egan Co., J. A. Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

ROSETTES
Waddell Mfg. Co., Grand Rapids, Mich.

RUBBING MACHINES
DeVilbiss Mfg. Co., Toledo, Ohio.
Mattison Machine Works, Rockford, Ill.

SAFETY DEVICES
Cowan & Company, Galt, Ont.

SANDERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Loeffler Machine Co., Wm. Sheboygan, Wis.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SAND PAPER
Manning Abrasive Company

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Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Elliot Machinery Co., Belleville, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SAWS
Atkins & Co., E. C., Indianapolis, Ind.
Disston & Sons, Henry, Toronto, Ont.
Elliot Machinery Co., Belleville, Ont.
Radcliff Saw Mfg. Company, Toronto, Ont.
Shurly-Dietrich, Ltd., Galt, Ont.
Simonds Canada Saw Co., Montreal, Que.
Wallace & Co., J. D., Chicago, Ill.

SAW BENCH
Wallace & Co., J. D., Chicago, Ill.

SAW SWAGES
Cowan & Company, Galt, Ont.
Crowel, D. J., Buffalo, N. Y.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Radcliff Saw Mfg. Co., Toronto, Ont.

SAW TABLES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Yates Machine Co., P. B., Hamilton, Ont.

SCRAPING MACHINES
Canada Machinery Corporation, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Whitney & Sons, Baxter D., Winchendon, Mass.

SCREW DRIVING MACHINERY
Reynolds Machine Co., Massillon Ohio.

SCROLL SAWS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Jackson, Cochrane, & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamiltonfi Ont.

SECOND-HAND MACHINERY
Casey, M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Osborne Sexton Machinery Co., Columbus, O.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

SHAPERS
Canada Machinery Corporation, Galt, Ont.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Sons, Baxter D., Winchendon, Mass
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SHAPER COLLARS
Woodworkers Tool Works Chicago, Ill.

SHAVING COLLECTORS
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STAINS
Ault & Wiborg, Toronto, Ont.
Marietta Pairt & Color Co., Marietta, Ohio.
Shannon Co., Ed. J., Cincinnati, Ohio.
Williams Bros. & Co., Hounslow, Eng.

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Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

STAVE SAWING MACHINE
Whitney & Son, Baxter D., Winchendon, Mass

STEEL DOOR MATS
Cary Mfg. Company, Brooklyn, N.Y.

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Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Yates Machine Co., P. B., Hamilton, Ont.

SWING SAWS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Eaglesfield, R. D., Indianapolis, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE LEG LATHES
Fay & Egan Co., J. A., Cincinnati, Ohoa.
Mattison Machine Works, Rockford, Ill.
Whitney & Son, Baxter D., Winchendon, Mass.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE SLIDES
Jefferson Woodworking Co., Louisville, Ky.
Walter & Company, B., Wabash, Ind.

TEMPERATURE REGULATORS
Canadian Powers Regulator Co., Toronto, Ont.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Compan, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TIME CLOCKS
International Business Machines Co., Toronto, Ont.

TOPS
Gorham Bros., Mount Pleasant, Mich.

TRIMMERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Preston Woodworking Machinery Company, Pretson, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TRUCKS
Cowan Truck Company, Toronto, Ont.
National Dry Kiln Co., Indianapolis, Ind.

TURNED WOOD GOODS
Algoma Wood Products Co., Algoma, Wis.

TWINES & WEBBING
Doon Twines, Ltd., Kitchener, Ont.

MORGAN
NAILING MACHINES

Are built strongly for heavy continuous service. Machines adapted to all kinds of special nailing.

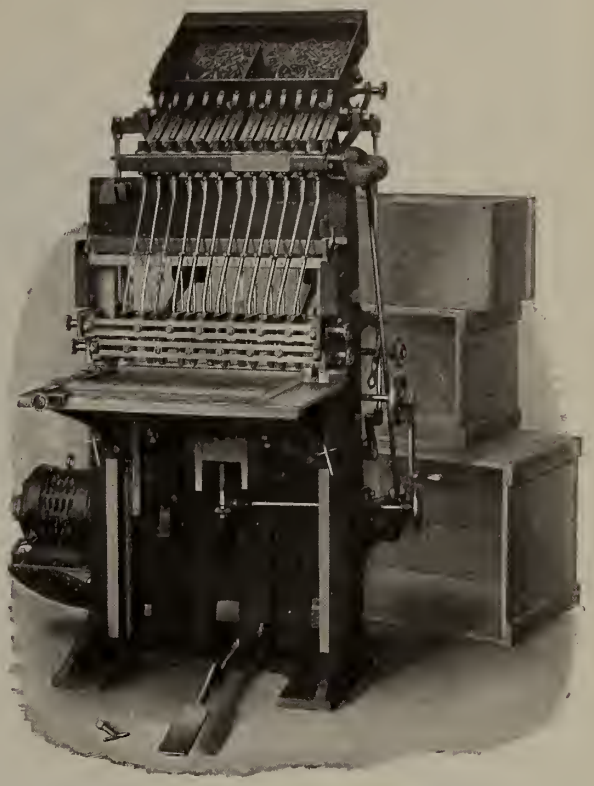
Regular machines for all sizes of boxes and crates.

Write us for descriptive literature.

Machines that save money

Morgan Machine Co.

DEPT. A ROCHESTER, N.Y.



Morgan No. 12-30 Open Back Nailing Machine, Fitted with motor.

You Can Use This to Advantage
The Olson Frame Extension

Increase the carrying capacity and therefore the usefullness of your Ford Truck by the addition of the Olson Frame Extension.

Particularly adaptable for the transportation of lumber and furniture for either short or long distances.

The perfect balance of the Olson makes smooth and easy running—a desirable feature when easily broken articles are being carried.

Our nearest branch will be pleased to send you fullest information.

Just a Few Users —

Robert Bury Co. Canada, Limited, Toronto, Ontario.

Langmuir Manufacturing Company, Toronto, Ontario.

Gardiner Lumber Company, Galt, Ontario.

Batts, Limited, Toronto, Ontario.

Swedish Crucible Steel Co. of Canada, Limited, Windsor, Ont.

Branches: 901 Royal Bank Bldg., TORONTO 285 Beaver Hall Hill, MONTREAL.

"Canadian Woodworker" Buyers' Directory—Continued

VARNISHES
Adams & Elting Co., Chicago and Toronto.
Ault & Wiborg Company, Toronto. Ont.
Penfound Varnish Co., Toronto, Ont.

VARNISH DRYERS
Nicholls Co., A. S., New York, N.Y.

VARNISH SPRAYERS
DeVilbiss Mfg. Co., Toledo, Ohio.
Paasche Air Brush Company, Chicago, Ill.

VENEERS
Batesville Lumber & Veneer Co., Lawrenceburg, Ind.
Birds Eye Veneer Co., Escanaba, Mich.
Bury & Compny, Robert, Toronto, Ont.
Central Lumber Co., Indianapolis, Ind.
Christmann Veneer & Lumber Co., St. Louis, Mo.
Curtis Co., C. E., Chicago
Dean Spicker Company, Chicago, Ill.
Empire Veneer Company, Chicago, Ill.
Evansville Veneer Co., Evansville, Ind.
Freiberg Lumber Co., Cincinnati, Ohio
Hartzell, Geo. W., Piqua, Ohio.
Hoffman Bros. Company, Fort Wayne, Ind.
Holden, Henry S., Chicago, Ill.
Hardwood Prudocts Co., Neenah, Wis.
Geo. Kersley, Montreal, Que.
Korn-Conkling Co., Memphis, Tenn.
Long-Knight Lumber Co., Indianapolis, Ind.
Litton Veneer Co., Rockford, Ill.
Memphis Veneer & Lumber Co., Memphis, Tenn.
Mowhawk Veneer Co., Warren, Pa.
Munising Woodenware Co., Munising, Mich.
Nartzik, J. J., Chicago, Ill.
National Veneer & Lumber Co., Indianapolis, Ind.
North Vernon Lumber Co., North Vernon, Ind.
Northwestern Cooperage & Lumber Co., Gladstone, Mich.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod-Jurden Co., Memphis, Tenn.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Veneer Co., New Albany, Ind.
Roberts, Geo. G., Chicago, Ill.
Southern Veneer Mfg. Co., Louisville, Ky.
Stimson Veneer & Lumber Co., Memphis, Tenn.
Sturm Co., Adolph, Chicago, Ill.
Talge Mahogany Co., Indianapolis, Ind.
Thompson & Co., Lewis, Philadelphia, Pa.
Toronto Veneer Company, Toronto, Ont.
Veneer Manufacturers Co., Chicago, Ill.
Waetjen & Co., George L., Milwaukee, Wis.
The Williamson Veneer Company, Mills—Baltimore, Md. Sales Branches, New York, N. Y., Chicago, Ill., Jamestown, N.Y., High Point, N.C.
Warren Ross Lumber Co., Jamestown, N. Y.
Wood Mosaic Co., Louisville, Ky.

VENEER TAPE
Canadian Nashua Paper Co., Peterboro, Ont.
Gummed Products Co., Troy, Ohio.
Ideal Coated Paper Co., Brookfield, Mass.

VENTILATING APPARATUS
Canadian Blower & Forge Co., Kitchener, Ont.
Neville Cooper Co., Toronto.

VENEER JOINTERS
Garlock-Walker Machinery Co., Toronto, Ont.

VENEER MACHINERY
Garlock-Walker Machinery Co., Toronto, Ont.
St. Joseph Iron Works, St. Joseph, Mich.

VENEER PRESSES (Hand and Power)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Perrin & Company, Wm. R., Toronto, Ont.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.

WALNUT LUMBER
American Walnut Mfrs. Assn., Chicago.
Pickrel Walnut Company, St. Louis.
Purcell Walnut Lumber Co., Frank, Kansas City.

WIRE
Laidlaw Bale-Tie Co., Hamilton, Ont.

WIRE BOX STRAPPING
Cary Mfg. Company, Brooklyn, N.Y.

WOOD FINISHES
Adams & Elting Co., Chicago and Toronto.
Ault & Wiborg, Toronto, Ont.
Penfound Varnish Co., Toronto, Ont.

WOODWORKING MACHINERY
General Machinery Co., Toronto, Ont.

WOOD STAINS
Williams Brothers & Co

WOOD TURNING MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Yates Machine Co., P. B., Hamilton, Ont.

WORK BENCHES
Fay & Egan Co., J. A., Cincinnati, Ohio.

WOOD LATHES
Colladay Machine Works, Indianapolis, Ind.
Oliver Machinery Co., Grand Rapids, Mich.

WOODWORKING SPECIALTIES
Brantford Pattern Works, Brantford, Ont.

One Man Does the Work of Two
with a Billstrom Glue Clamp Carrier

For every plant where much edge-gluing is done there is a real need for a Billstrom.
Here's why:—

The empty clamp is held at just the right height for the greatest convenience of the workman.
When the clamp is filled he pulls a cord, which carries the filled clamp away and deposits an empty one in its place.
One man can accomplish as much by using it as two men can do employing the old methods.
It holds the work off the floor until the glue has set, when the glued stock can be quickly removed and piled flat, thus greatly conserving space.
It reduces the labor and cost of edge gluing to the minimum.
There is a sizs to suit your particular requirements.

N. J. BILLSTROM
2002 NINTH ST. ROCKFORD, ILL.

44 Yates No. 275
36 and 66-in. Automatic
Knife Grinders,
Brand New, at
One-half Price

Machines arranged for Motor Application as per cut, or regular belt drive, if wanted.

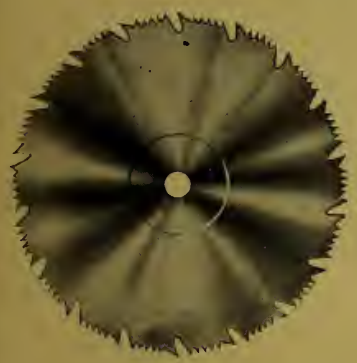
We have in Cincinnati, available at once, three Whitney 30-in. single surfacers and two Whitney 30-in. double surfacers, all with sectional rolls; three double arbor revolving saw tables; three single arbor tilting table saw benches; F.&E. single-end tenoner with roller table, and a few other choice machines. All are in exceptionally fine condition—are doing precision work at the present time.

7 New Hermance Molders, 8, 10 and 12-in., Stationary and slip-on heads.
8 New Andrew Multiple Vertical Borers, 20, 30, 42 and 60-in., any number of heads.

Band saws, 32, 36 and 38-in.
Borer, Andrew, 10-ft., 13-spindle, power table.
Borers, Andrew mult. vert., 20, 42 and 60-in., new.
Door clamp, Fay-Egan, heavy.
Door clamp, Jenkins-Hayes power-feed.
Edgers, two, three and four saws.
Glue cookers and retainers.
Jointers, 8, 12, 16, 20, 24 and 30-in.
Lathes, speed, eight, mounted on iron bed.
Lathes, turning automatic, Mattison No. 8
Yates No. 72, practically new.
Matcher, American Northwest, 24x8-in., 3 sides.
Matcher, 24x6-in., 3 and 4 sides.
Molders, 4-side, 9, 10 and 12-in. American.
Molder, Fay & Egan, 12-in. outside, heavy.
Mortiser, chain saw, New Britain No. 7, new.
Mortisers, F. & E. vertical, hollow-chisel; also plunger type; Greenlee vertical, double hollow-chisel.
Nailers, two, Hayes, 8-track, 8d, closed back.
Nailing machines, 2 closed back, 4-track, 4d, 15-in. spread, Hayes' make.
Pony planers, 16, 20 and 24-in.
Rip saws, self-feed, Hoosier, F. & E. Greenlee.
Rip saw, gang, Luther, for box work.
Router for stair stringers.
Sand belt, closet seat and similar work.
Sander, H. B. Smith, spindle and disc, practically new.
Sanders, 30- 42 and 54-in. Columbia; 30, 42 and 48-in. Invincible; 30 and 36-in. F. & E. double.
Saw, 8-ft. double cut-off, roller table.
Saws, combination and variety, single and double arbor, also tilting arbor, stationary and tilting table, 24 and 30-in. circular resaw.
Saw, circular re-slab, 40-in. blade, power feed rolls.
Shapers, Fay single-spindle reversible, also Shimer single with overhead routing attachment.
Shaper, Whitney No. 7 and 8 double-spindle, practically new.
Surfacer, 30-in. double, cabinet, B. & M., practically new.
Surfacer, Whitney 30-in. double, sectional roll and sectional chipbreaker; American No. 4¼, 36-in. sectional and solid; Fay & Egan No. 140, 27 and 30-in. double divided rolls; also 18, 20, 24 and 30-in. single cylinder panel planers.
Tenoners, Fay & Egan double-end, also single-end.
Window frame machine for production work, new.
Window frame machines, Smith & Phillips combination.
Wood-worker, universal, Fay & Egan and Bentel & Margedant. One lot of glue room machinery.

We have just received two carloads of Band Saws and Jointers—all new—which are ready for immediate delivery.
Band Saws, 20, 26, 32, 36 and 38-in. Jointers, 8, 12, 16 and 24-in.

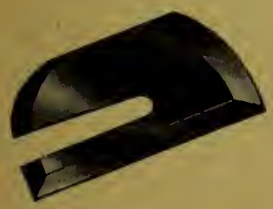
The Osborne & Sexton Machinery Co.
Re-manufacturers **COLUMBUS OHIO**



ATKINS
STERLING QUALITY
SAWS and KNIVES

The best steel—the most careful and accurate workmanship—the equipment that will eventually save you money.

Atkins Sterling Quality Saws and Knives are proving their superiority by competitive tests in the largest plants of the country. We welcome your most careful investigation, as we know the satisfaction that will result.



Write to-day for our Knife Booklet "C W" and Pattern Template Paper

E. C. ATKINS & CO.
Makers of Sterling Saws

Factory—HAMILTON, Ont. **Vancouver Branch—109 Powell Street**

More *than* Economy *and* Speed

A Battery of "Automatics" at Stickley's, Grand Rapids

THE Mattison Automatic Shaping Lathe produces turnings much faster and cheaper than is possible with hand methods or with old style machine equipment.

BUT of even greater importance is its flexibility which gives your designer free play in creating his designs. It faithfully reproduces all the historic round, square and octagon turned work, which plays so important a part in the new, distinctive patterns of today.

MATTISON
Automatic
The Standard Shaping Lathe
OVER 3000 IN USE

If it is worth while to bring out new patterns, isn't it just as important to give equal consideration to the best and most economical method of producing those patterns?

MATTISON MACHINE WORKS

Main Office and Works:

ROCKFORD, ILLINOIS

Branch Sales Offices:

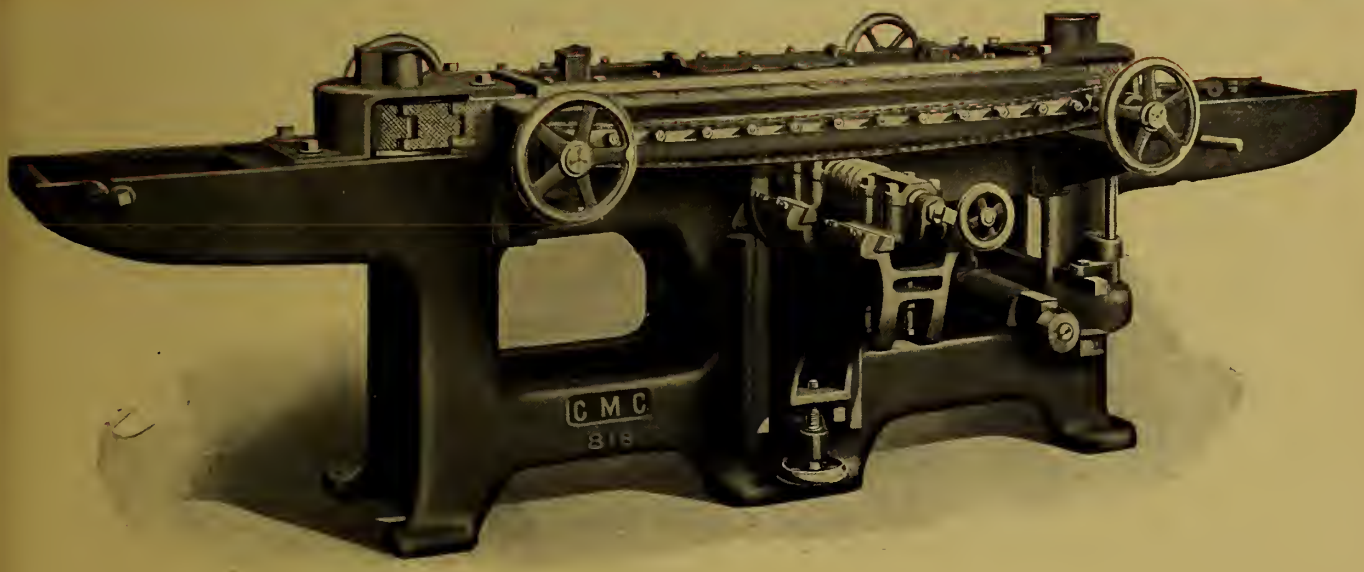
CHICAGO
1735 Republic Bldg

NEW YORK
110 West 40th Street

GREENSBORO, N.C.
American Bank Bldg.

Volume Twenty-One TORONTO, MARCH, 1921 Number Three

CANADIAN WOODWORKER and Furniture Manufacturer



C.M.C. No. 818 Automatic Continuous Feed Glue Jointer

The only Automatic Glue Jointer that can be set instantly to make either a straight, hollow or spring joint, the last being a positive preventative for long stock opening at the ends.

It will work material ¼″ to 3″ thick, any with from 1″ up and stock as short as 6″. It can, however, be arranged to take stock 4″ if so desired.

Write for Illustrated Bulletin and Prices.

CANADA MACHINERY CORPORATION, GALT, ONTARIO
LIMITED

Alphabetical Index to Advertisers, Page 12

Model 1-D Portable Drill

HANDY—ECONOMICAL—EFFICIENT

Specifications:

Length—10 inches.

Weight—4¾ pounds.

Capacity—Steel, 0 to 3/16". Wood and alloys, 0 to 1/4".

Motor—Universal, on either direct or alternating current.

Diameter of Motor—3⅜ inches.

Spindle—Offset from center 3/32".

Helical Gears.

Aluminum Handle.

Complete with 10-ft. cord, plug, switch and chuck.

Jacob's Chucks used as a regular equipment.

FOR speed in drilling and countersinking small holes, this tool is just what you need. It can be used on any kind of material—steel, iron, brass, aluminum or wood—and gives lasting service.

If your dealer cannot supply you with the Model 1-D, tell us about your requirements.

Wisconsin Electric Company
7133 Sixteenth Street, Racine, Wisconsin, U. S. A.

DUMORE GEARED ELECTRIC DRILLS

FIRST CLASS MECHANICS

used these tools in a plant operated by large departmental store for manufacturing high grade fixtures; these

Machines are in the Best of Condition

and are offered at prices which are sure to interest you now that business is showing such a pronounced improvement.

1—McGregor-Gourlay Double Arbor Universal Saw Table, same as C.M.C. No. 618, with 14″ saws, self-contained countershaft, full complement of gauges, saws, wrenches, etc.

1—Ditto as above.

1—Preston No. 127 Variety Saw Table, countershaft attached, one 14″ saw.

1—Ballantine 36″ Band Saw, with solid lower wheel, complete with saw blades, wrenches, etc.

1—Ballantine Two Spindle Shaper, Spindles 20½″ centres, diameter of spindles where collars go on 1⅛″, top 42″ x 42″.

1—American No. 1 Single Spindle Shaper. Fig. 937 with plain countershaft.

1—C. M. C. No. 507 Mortiser, with boring attachment.

1—C.M.C. No. 624 Hand Feed Rip Saw Machine, with self-contained counter shaft, table 6′6″ long by 40″ wide, with plain box gauge, 22″ saw blades, 1¼″ arbor with cone for receiving saws different diameter.

1—Ballantine 8″ Four Sided Moulder, complete with square heads and straight knives on all heads.

1—American No. 2½ Single End Tenoner, with two copes and cut-off saw attachment. Fig. 9431 in American Woodworking Machinery Catalog.

1—Ballantine 16″ Buzz Planer with square cylinder, full set of knives and countershaft.

1—C.M.C. No. 646 Roller Table Cut-off Saw, sliding table 7′6″ long, stationary table 50″ to the saw, sliding table equipped with stop gauge, including five stops, with countershaft, complete with saws, wrenches , etc.

1—Yates No. 156 27″ by 6″ Single Surfacer with solid roll and chipbreaker, full set of knives, wrenches and countershaft.

1—Cowan Combination Vertical and Horizontal Boring Machine, complete with wrenches, etc.

1—Wood Frame Belt Sander, complete with roller table.

1—Hespeler 12″ Buzz Planer, fitted with round cylinder, full set of knives, countershaft, wrenches, guard, etc.

1—Ballantine Tilting Table Double Arbor Saw Table, same as C.M.C. No. 616, arbor raising and lowering, fitted with full set of gauges, countershaft, saws, etc.

1—Preston 36″ Band saw, lower web wheel and guards.

1—McGregor-Gourlay Variety Saw Table with countershaft attached, guard, gauges, tilting table, wrenches, etc.

8—Sections Cowan Four Screw Veneer Press 12″x50″, four sections 27″ clear space under screw plates, four sections 32″ under screw plates.

1—24″ Francis Double Roll Glue Spreader.

4—Sections Cowan Three Screw Veneer Press 38″x12″, 28″ clear space under screw plates.

1—American No. 4½ Single Surfacer, with solid roll and chipbreaker.

1—American No. 26, 10″ Outside Moulder, 4″ side heads, latest type machine, complete with knife jointers and all equipment, new straight knives on all four heads.

1—C.M.C. Arm Sander, No. 438, with paper cutter.

1—Universal Knife Grinder, 37″, made by American Wood Working Machinery Co., Fig. 1126 in their catalogue.

1—60″ Sturtevant Single Slow Speed Exhauster, left hand, top vertical discharge, complete with platform and rods to suspend from ceiling.

1—Pair 24″ Pulleys.

1—18″ Filing Vise.

1—Foley Band Saw Setter.

The last three items for use in sharpening small size Band Saws.

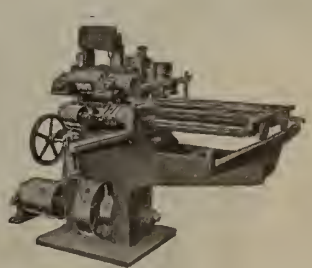
American No. 25 Power Feed Edging and Ripping Saw

Garlock-Walker Machinery Co., Limited

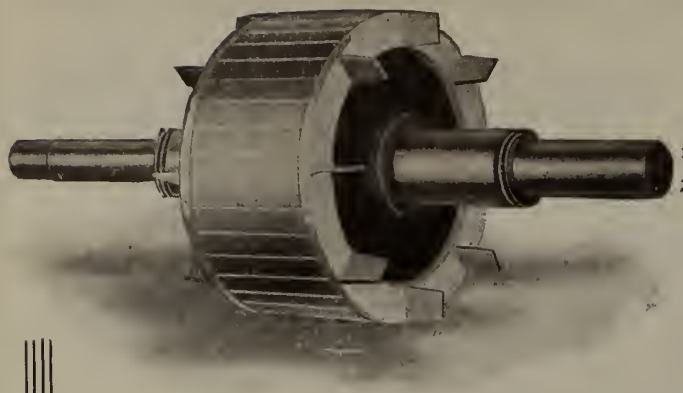
32 Front Street West

WINNIPEG TORONTO MONTREAL

Everything in Woodworking and Metal Working Machinery



American No. 2½ Single End Tenoning Machine



No Soldered Joints or Bolted Connections in

Canadian Crocker - Wheeler Rotors

The greatest improvement in modern induction motor design—no soldered joints to melt and cause arcing or open circuits and no bolted connections to work loose. The risk of fire as well as the possibility of motor troubles and consequent delay, is thus greatly reduced if not eliminated entirely.

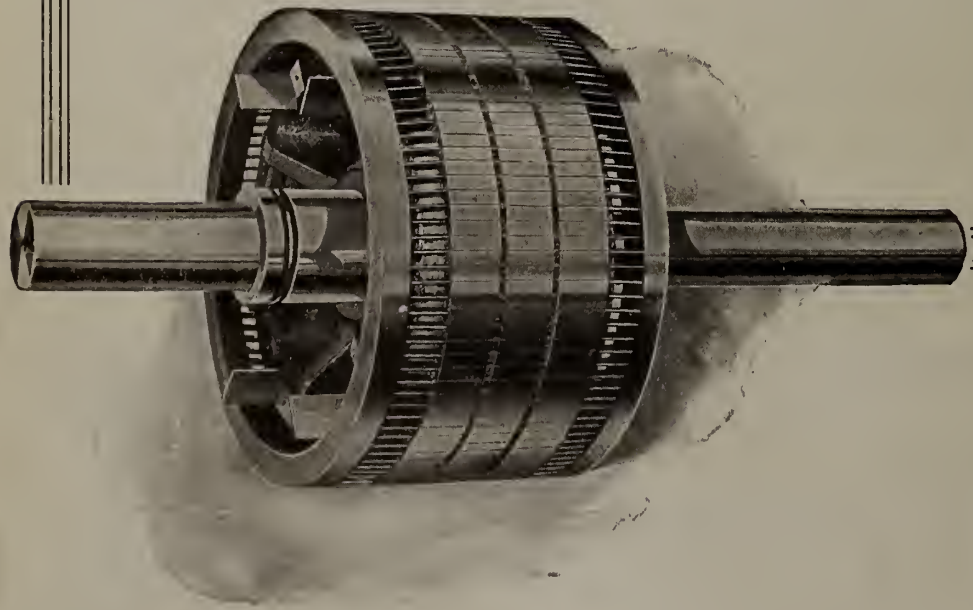
¶ The entire Rotor Winding of small squirrel-cage induction motors is cast of aluminum alloy—in one operation. Thus, the complete winding is one integral structure.

¶ The medium and large size Rotors have liberal section copper bars and the end rings are cast-welded, making perfect contact.

The generous bearing sizes and sturdiness of mechanical construction throughout, further emphasizes the superiority of our motors for woodworking plants.

Northern Electric Company
LIMITED

Montreal	Quebec	Toronto		Windsor	Regina	Edmonton
Halifax	Ottawa	Hamilton	London	Winnipeg	Calgary	Vancouver



In Stock at our Branch Houses

A New Edge Sander

The Invariable Choice Yates Of the Man Who Knows

TYPE S-2

This New Edge Sander has been constructed only after a careful study of the field in which it is to find its usefulness.

This Sander possesses all the good features of other makes in addition to having advantages over them.

Here is a new machine Sander users should know about. Let us acquaint you with its sanding possibilities. We will gladly do it without any obligations on your part.

P. B. Yates Machine Co. Limited

Hamilton - Canada

No. 140-A Surfacer will set New Standard for Production and Grades in your Mill and Factory

No. 140-A Patented Double Cylinder Surfacer

No. 351 Automatic Feeder

Furniture manufacturers are quick to realize that a wonderful finish invariably sells the furniture. No. 140-A whether used for general surfacing or the finest smoothing work will set new standards for production costs and grades in your mill or factory.

No. 140-A is especially valuable to concerns which do not buy the highest grade of lumber, as it will finish this low grade stock perfectly, not tearing out even when working knotty or cross-grained stock.

Exclusive Fay & Egan construction features, make this machine a fine investment from the standpoint of initial cost, power and up-keep expense, and results.

Send for our special Bulletin B-12 for full information.

J. A. Fay & Egan Company

ESTABLISHED 1830

World's Oldest and Largest Manufacturers of Woodworking Machinery

153-173 West Front Street, Cincinnati, Ohio

The "Shimer Limited" Expansion Head

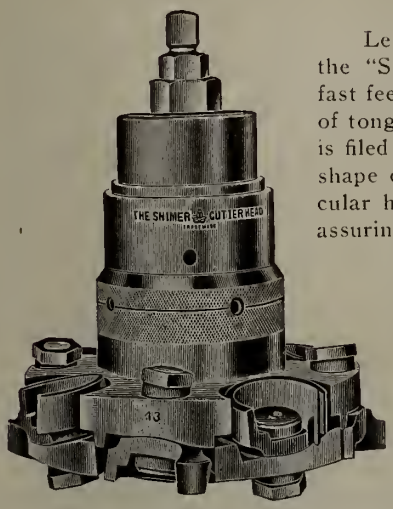


Fig. 627

Let us draw your attention to the advantages of using the "SHIMER CUTTER HEAD" for general Mill and fast feed Planer work. The Cutter is turned to cut the shape of tongue and groove desired, so that to sharpen the cutter it is filed or ground on its face, guaranteeing the user the same shape of cut during the life of the cutter. The bit being circular has from 3½ in. to 5 in. cutting length to the cutter, assuring long wearing life to the cutters.

Note that the cutter, being fastened to a concave seat on a compound angle, assures the user of the proper clearance of cutters, consequently they never burn.

These heads are fitted with or without the Self-Centering Sleeve, and made Expansion or Solid, to suit the customer's wishes.

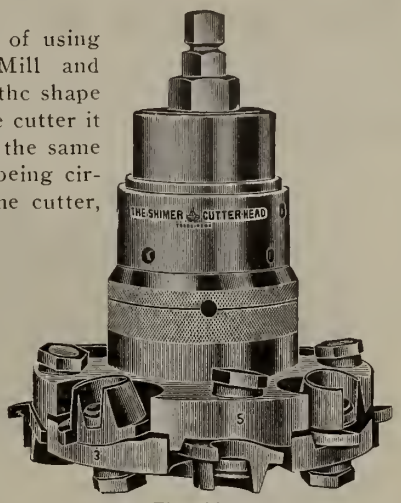


Fig. 268

Shimer Heads have been in use for sixty years, and their reliability and reputation have spoken for them in the past. Let us know your wants and we will guarantee their reliability at the present.

SHIMER CUTTER HEAD CO. OF CANADA, LIMITED

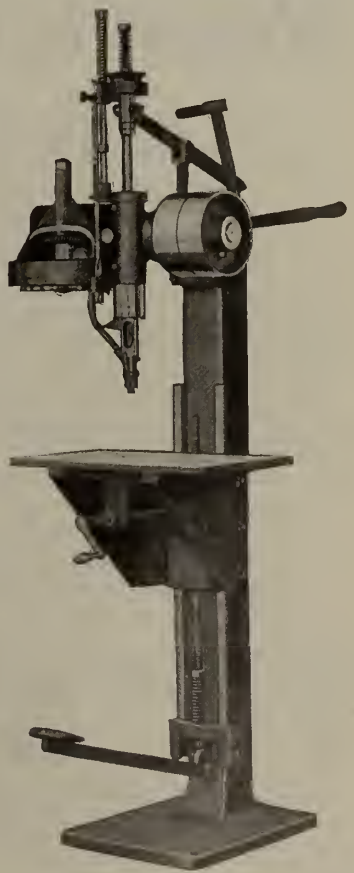
Manufacturers of Cutter Heads, Safety Cylinders and Grinders

GALT, ONTARIO

Magazine Fed Screw-Driving

Reynolds' No. 2 Standard Type Machine

This MEDIUM size Reynolds will magazine and drive without change or adjustment three consecutive sizes of wood or machine screws from No. 6 to No. 14 inclusive. If smaller than No. 10 up to 1½" long; No. 10 to No. 14 inclusive up to 1¾" long. Quickly interchangeable sets of parts can be furnished at slight cost to increase the range of screws driven.
Will drive screws to the center of an 18" circle in work not over 19" high. For use on work requiring greater depth of throat, such as attaching hardware to Cabinet Doors, Closet Seats, etc., Gap Column may be substituted, allowing screws to be driven to the center of a 48" circle in work not over 6" high. Below the Gap the Machine has same depth of throat as Standard Machine (9").
Automatic Stop may be furnished when desired.
Boring Attachment furnished where necessary to bore before driving screws. (Either single spindle or cluster head.)
Pulleys tight or loose 8" diameter for 2½" belt.
May be equipped for individual motor drive. Any Standard Electric Motor furnished at list price.
Spindle Speed 700 to 850 R.P.M. Pulley Speed 450 to 550 R.P.M.
Power required from one to two horsepower.
Table Size 14" x 24". Base Size 16" x 20". Height 6'7".
If you want to cut down labor costs in the screw driving department by 85% instal this machine at once.



The Reynolds Machine Co.

Department C

Massillon, Ohio, U. S. A.

Chapman Double Ball Bearing Co. of Canada

Limited

TORONTO - ONTARIO

They'll fit your present hanger frames

They Save Their Weight in Gold

This is not said for effect—it's a fact.

If you took the actual bearings in a Chapman Double Ball Bearing, and weighed them against the amount of money in gold that you would save by using them in place of the old-style babbitted hanger bearings, or roller bearings, the two would balance.

The saving works out from 15% to 40% of the power used, when running under full load. If you are using 100 h.p. at $30 per h.p. a year, that fixes the saving at from $500 to $1,200 a year.

You can buy quite a lot of gold for that.

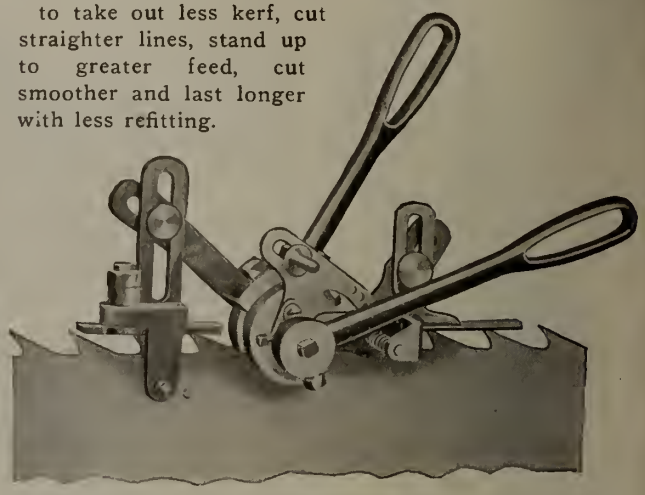
We use this simile to stimulate your imagination sufficiently to inquire into the utility of Chapman Ball Bearings.

If you do inquire, we'll sell you also by an appeal to your reason.

"You pay for them whether You buy them or not."

It's the Uniform Swaged Tooth that Gives Results

With each tooth a cutting point, the strain of the teeth being equalized on each side, the saw can be fitted to take out less kerf, cut straighter lines, stand up to greater feed, cut smoother and last longer with less refitting.



D. J. CROWELL

61 TERRACE, BUFFALO, N.Y., U.S.A.

Canadian checks accepted at par

Quite Often

you will find the very thing you are looking for in these advertising pages. It will pay you to read them.

When Your Machinery Starts, Start It Right With

D. K. McLAREN'S
Genuine Oak-Tanned Belting

Every D. K. McLaren Belt is made from the Back of the Hide—the best portion for belting purposes. It is British Oak-Tanned — the most approved process known for preparing belts for hard service.

These two facts account for the success it has everywhere attained and particularly in the woodworking industry where belting plays so important a part.

Why not let us send you full particulars?

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Montreal, P.Q.
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D·K·McLAREN LIMITED

TORONTO, ONT.
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ST. JOHN, N. B.
80 Germain Street

VANCOUVER, B.C.
334 Cordova West

"Treat Your Machine as a Living Friend."

A Canadian-Made Product

"PRESTON" No. 132 36 ins. BAND SAW

View Shows machine guarded with bottom iron doors open

SPECIAL FEATURES

1.—All Steel Wheels covered with solid rubber bands ¼" thick.

2.—Perfect Tension Device and style of guide that, combined, reduce saw-breakage to a minimum.

3.—Universal alignment of wheels.

4.—Convenient adjustments. Smooth, steady operation.

5.—Supplied with 3 H.P. Electric Motor for individual drive if desired.

6.—Supplied with SKF Ball Bearings in upper and lower wheels if desired.

HAS FEW EQUALS—NONE ARE BETTER
Write for descriptive pamphlet and prices

The Preston Woodworking

We are the Sole Manufacturers and Agents in Canada of the Eaglesfield Patented Beltless Swing Saw—See advertisement page 17.

A Simple, Practical Machine
For Fine Accurate Work

No. 125.—TILTING TOP SAW TABLE

Frame Cast in One Piece. **Easy and Rapid Adjustment of Saw.**
Special Locking Device. **Belt Tightening Bushes on Countershaft.**
Arranged for Individual Motor Drive if Desired.

This Engraving represents a new Rip and Cut Off Saw Table, a medium sized machine, convenient for Dadoing, Grooving, Rabbeting, Mitreing, Bevelling, Etc. It is intended especially for fine and accurate work on Furniture, Sash and Door, Cabinet, Pattern and General Woodworking Shops. The design is simple and practical and the construction is high-class throughout.

The Frame is cast in one solid piece making it rigid and strong. The Table is planed perfectly true and has a removable wood throat plate allowing extra thick saws or Dado Heads to be used. The machine will carry saw blades up to 14" diameter.

A Boring attachment or a Boring and Mortising attachment with a wood table, can be furnished with this machine, if desired.

WRITE FOR BOOKLET AND PRICES.

Machinery Company, Ltd.
PRESTON, ONTARIO

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COWAN WOOD TOOLS are the BEST

POWER FEED RIP SAW 280

Variable Feed. Large Table. Simple, Strong, Compact.
Feed Works and Table both adjust by Hand Wheels.
Adjustable for Short or Long Stock. Feeds Stock 6" Thick.

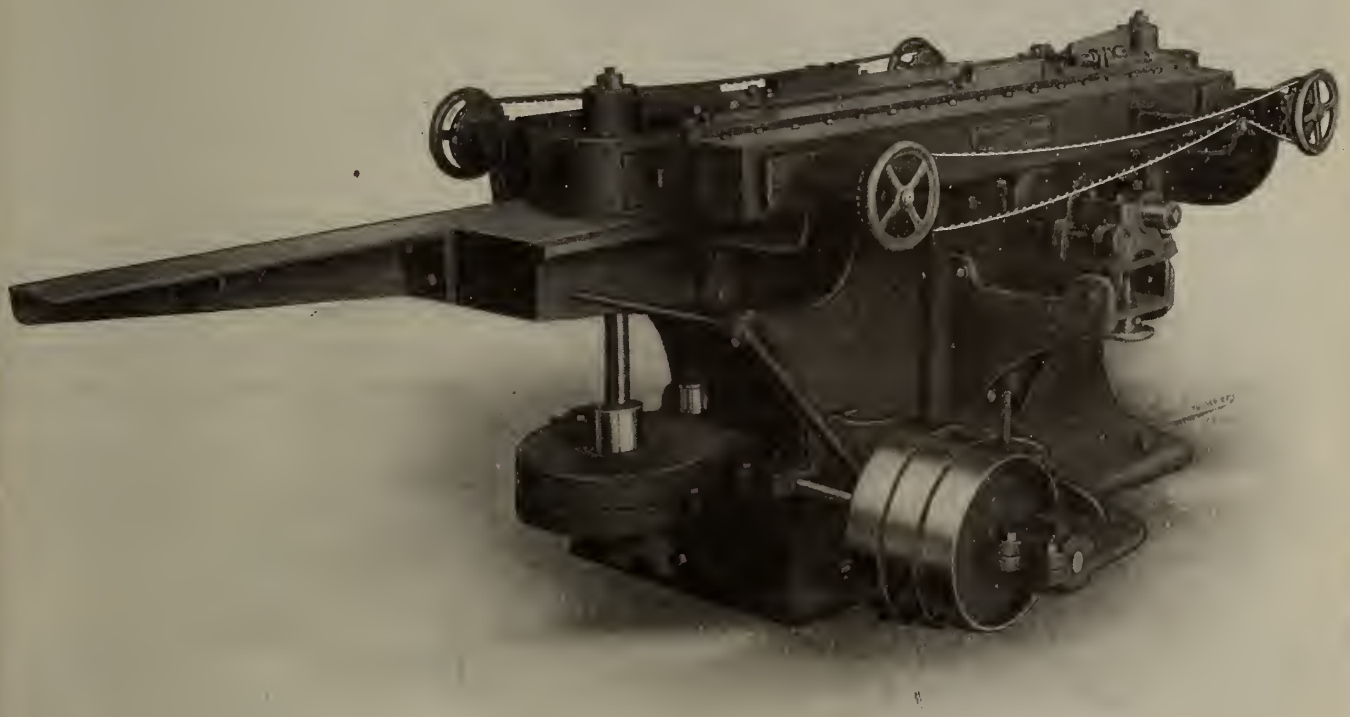
COWAN & COMPANY OF GALT LIMITED

GALT - ONTARIO

Will do the work of Five Hand Jointers in making Glue Joints

This is the guarantee given with our

No. 4 Continuous Feed GLUE JOINTER



Strongest and most complete machine on the market.
Any part may be readily removed or renewed.
Feeds in opposite direction, giving 100 feet per minute.
Works material from six inches up to any length desired.
Also from one quarter to 3 inches thick, and from three-quarters of an inch wide up to any width.
1 set Shimer Special Jointer Heads supplied with machine.

Investigate the merits of this machine—it will pay you!

Jackson, Cochrane & Company

KITCHENER - CANADA

14-Inch Junior Bench Band Saw

Are you a pattern maker?

Do you do small accurate work?

3
TYPES OF DRIVE
for
Your Convenience

MOTOR DRIVE BY BELT
MOTOR DRIVE BY GEARS
DIRECT MOTOR DRIVE

Direct Motor Drive

The Band Saw which does
ACCURATE WORK
and takes
LESS SPACE

The
REAL Bench Band Saw
for
PROGRESSIVE PEOPLE

We also manufacture
The Famous "West Side" 36" & 42" Band Saw & 42" Band Rip Saws
HAVE "THE VERY BEST"
WRITE US OR SEE YOUR DEALER

WEST SIDE IRON WORKS

OFFICES 1220 Washington Blvd., Chicago, Ill.

Leading Makers of Motor Driven and Ball Bearing Band Saws

THE VERY BEST

WORKS Grand Rapids, Mich.

The Taylor TRADE MARK

The Taylor TRADE MARK

Clamp Carrier

Largest Capacity
Smallest Floor Space

Quickest Acting Most Powerful Clamp Known

One user writes:—"Additional equipment has so speeded up our Jointing Department as to necessitate the installation of a TAYLOR CLAMP CARRIER."

A. R. WILLIAMS MACHINERY CO., Toronto, Canada—Representatives

James L. Taylor Manufacturing Co.

POUGHKEEPSIE, N. Y.

More Steam Needed

No question but that business conditions are showing steady improvements.

There isn't a community in Canada that couldn't use profitably double their present consumption of wood products.

Don't wait until you actually have the orders on your desk before you order that new Boiler equipment. That kind of delay costs you money

A Section of one of our Shops

Engineering and Machine Works of Canada, Limited

St. Catharines, Ont.

Eastern Sales Offices:
Hall Machinery Co., Sherbrooke Que., and Birk's Bldg., Montreal

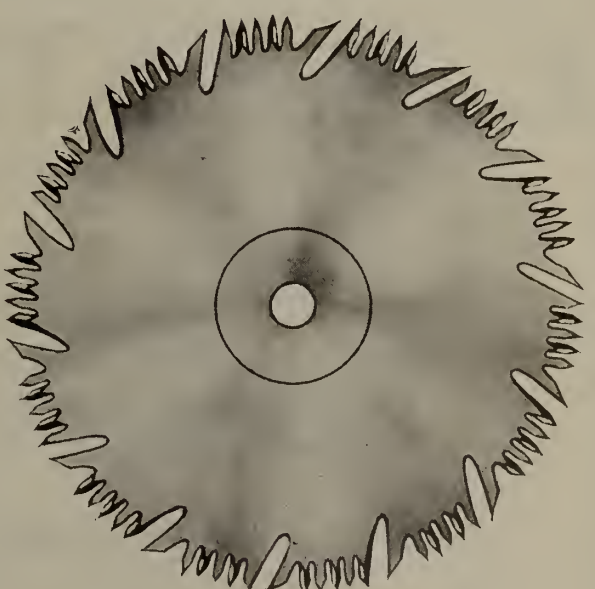
Where do your Profits come from?

To-day, profits are coming from increased efficiency plus lower overhead expense. The need of the hour is for machinery and tools that will do better work, increase the efficiency of the workman, and by long, dependable service reduce overhead costs.

Groover Saws used on shaper or saw table.

That is why more and more furniture manufacturers and woodworkers are turning to Radcliff "Beaver Brand" saws.

Write and let us tell you why.



Planer Saws for all trimming and smooth ripping.

Radcliff Saw Manufacturing Company, Limited

1550 Dundas Street West **TORONTO, ONT.**

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ESTABLISHED 1847

Manufacturers of

Turned Wooden Boxes, Handles, Spools, Clothespins, Skewers, Toys, Penholders, Rulers, Yard Sticks, Indian Clubs and Dumb Bells, Locked Corner Boxes, Box Shooks and Polished Hardwood Boxes

All Kinds of Turned and Shaped Wood Work

Enamelers in Black and Fancy Colors

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(NEAR 34th STREET)

Eaglesfield "BELTLESS" SWING SAW

Announcing——

A new design with special high-torque small-diameter

MOTOR DIRECT ON ARBOR

In addition to the present type of EAGLESFIELD BELTLESS SWING SAW, motor gear-connected, which was put on the market in 1919, we now announce a new design, with motor mounted directly on 2-in. spindle—gears entirely eliminated.

With ample power for saws up to 24-in., this new design permits a range of cutting from the small shop requirements up to heavy-duty service in car shops and saw mills.

Motor connection takes up only 3½ in. of saw, leaving ample clearance—as on a 24-in. saw, 8¼-in. cutting surface is available. Saw can be trammed for more accurate cutting than you have been accustomed to.

The unified hanger construction, resilient spring action, and the 7-in. section column are identical with the gear-head machine.

Motor is of the enclosed, built-in type, 25 or 60-cycle, 2 or 3 phase, any voltage. Extra large size S K F ball bearings. Saw up to 24-in. included in equipment.

Made in Canada

Preston Woodworking Machinery Co.
PRESTON - ONTARIO

R. D. EAGLESFIELD
22nd St. and Northwestern Ave. INDIANAPOLIS, IND.

Have You a Circular of the *EAGLESFIELD* "Beltless" TILTING ARBOR SAW

"Every board you use has to be cut off"

Suppose You Were Making a Very Fine Period Suite, or Perhaps a Phonograph Period Model

This sort of a piece absolutely deserves trimming that is attractive and correct

LET US SEND SAMPLES

F2-4141

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WE MAKE IT—and everything else in the Hardware line

WEBER-KNAPP CO., Jamestown, N.Y.

STRONG AS THE ROCK

TRADE MARK MONITE WATERPROOF GLUE

Made Under U.S. patent

Representatives and stocks at:—

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DETROIT
ST. LOUIS
MINNEAPOLIS
SAN FRANCISCO
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Monite Waterproof Glue

represents proved superiority. MONITE satisfies all the requirements in glue, namely:

Strength Uniformity Dependability Heat and Water Resistance
Unchanging Adhesion in All Weathers and Climates.

The product of years of research and experiment, MONITE offers new and greater value—the best waterproof glue obtainable in America. It can be adopted with confidence in every branch of the woodworking industry.

Write for our booklet— let us submit prices and samples.
Our skilled demonstrators are at your service.

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Distributors for South & West
St. Louis, San Francisco

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W. H. Cunningham Co.
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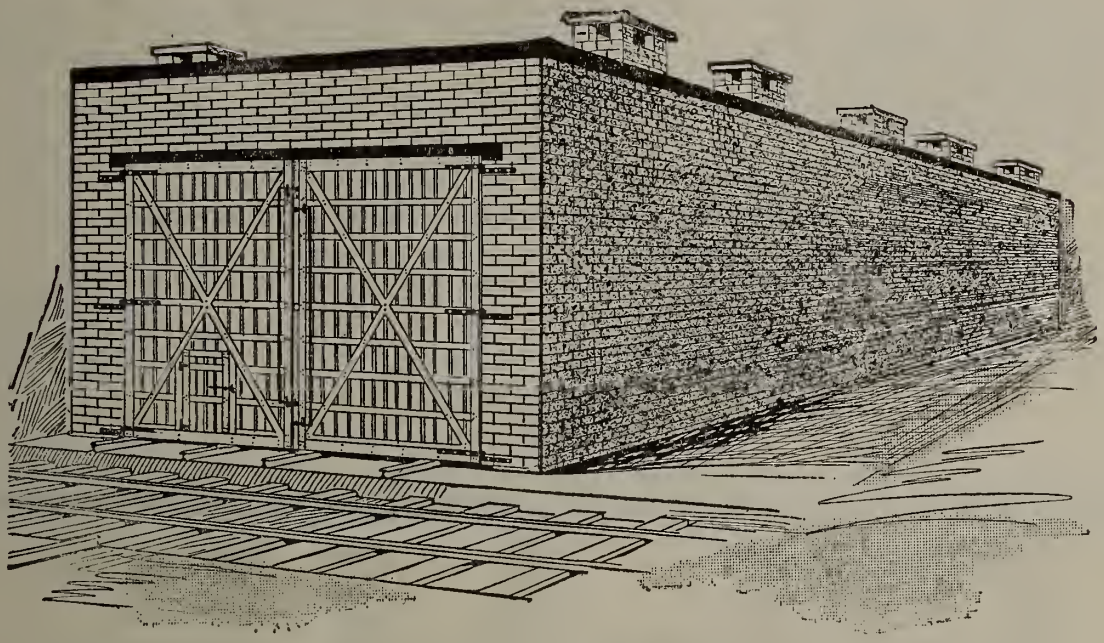
MONITE WATERPROOF GLUE

Cutler TRADE MARK

One Kiln Does the Work of Two



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The patented mechanical construction of the Cutler Kiln is new in the sense that it is not generally known, but it has been thoroughly tested in actual service for many years. There are no other kilns which have the following valuable features:

1. Even distribution of temperature and humidity in all parts of the kiln.
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4. Circulation of every cubic foot of air inside the kiln from 2½ to 3 times per minute.
5. A moisture removing means that does not require condensing coils or the introduction into the kiln of outside cold air.

WRITE US FOR OUR SOLUTION OF YOUR DRYING PROBLEMS

DRY KILN DEPARTMENT of CUTLER DESK COMPANY

Drying Specialists - Buffalo, N.Y., and Bridgeburg, Ont., Mentholatum Bldg.

Pacific Coast Division:

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MIRRORS

GRAND RAPIDS QUALITY

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Makers of Highest Grade Mirrors and Plate Glass Tops Since 1900

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FOR THE FINEST CABINET WORK AND VENEERING.

Suitable for All Climates.
Great Strength & Light Colour.

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Shaving and Sawdust Collecting Systems Installed Complete

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Mixed Cold—Used Cold

COST

FOR JOINTING—very much less than the hide glues.

FOR VENEERING—A little more per pound than vegetable, but little, if any, more per GLUE LINE FOOT.

Hundreds of large manufacturers are using "CASCO" to produce the BEST veneered products, at no increase in cost.

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Manufacturers of Casein Glues for twenty-five years

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NOTE. Send for Casco Red Book. It contains much information on glue, veneer and panels.

Over 10,000 Satisfied Users

"INTERNATIONAL" Electric Glue Heaters

Fireless cooker principle conserves and utilize every bit of heat generated. Holds glue at correct working temperatures without guesswork. Average cost of operation about one cent per day. Keeps glue at correct temperature for greatest tensile strength. Properly glued joints never fail. This heater has a place in every shop and factory. Sizes, one pint to fifty gallons. Heavy spun copper construction. No seams or soldered joints. Three heats. No water bath. Clean, safe, economical. Portable. Fits any lamp socket. Used by Prominent concerns everywhere.

Write for folder, "Correct Temperature in the Glue Room."

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ELECTRICAL HEATING APPLIANCES

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402 Vancouver Block

"International Electric Heaters are Better."

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For repairing splits, checks and other defects in face veneers. Made in colors to meet the requirements of the best finishes of all cabinet woods.

Put up in tubes for convenient use on surface stock and in quart cans for larger defects in core stock.

QUICK REPAIR has been used by some of our customers for a number of years.

Small sample tube mailed free on request.

Manufactured and sold exclusively by
Makers of

PERKINS
183

Trade Mark Reg. U.S. Pat. Off.

Perkins Glue Company

Factory and General Offices:
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Sales Office:
South Bend, Indiana

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Courtesy Kelton-Aurand Mfg. Co.

Art-Fibre Cord and Art-Fibre Stakes give quality results from the time they enter your factory.

Workmen don't complain when they are satisfied with the materials they have to use. And they like to work with Art-Fibre.

It's the same all the way down the line from workman to the ultimate consumer of the furniture. Art-Fibre gives satisfaction.

This strong, uniform, economical weaving material fulfills every requirement.

Manufacturers of upholstered furniture should know about Unaflex Seaming Cord. A uniform, flexible and economical cord for upholstered furniture.

Write for Samples and Prices.

GRAND RAPIDS FIBRE CORD CO.

GRAND RAPIDS MICHIGAN

Perkins Vegetable Glue

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Numerous opportunities come our way to cheapen our product by making short cuts in our manufacturing process thus allowing us to sell at a lower price. We do not do this because the Trade would pay the bill first and later we would suffer in loss of trade.

The Home of

PERKINS 183

TRADE MARK (Reg. U.S. Pat. Off.)

Our Canadian Factory is located at Hamilton, Ont.

The Name to Go By When You Go to Buy
Its First Cost Is Its Last Cost

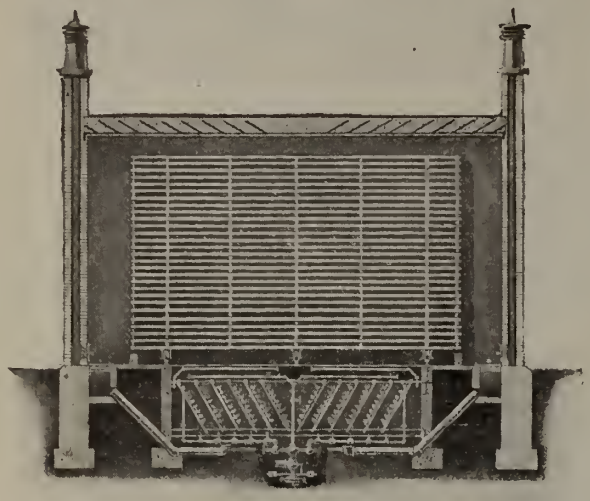
Process and Product Patents covering Perkins Glue were granted July 2nd and March 19th, 1912, and have been held valid and infringed by the United States Circuit Court of Appeals. Patents have also been granted in Canada, Great Britain, Germany, France, Belgium, Italy and other foreign countries.

PERKINS GLUE COMPANY

Factory and General Offices:
Lansdale, Pennsylvania

Sales Office:
South Bend, Indiana

Thermo-Myst System



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DRY KILNS

Investigate the merits of our system. Catalog and layouts mailed on request.

Curtis-Hosey Dryer Co. of Canada

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MAGIC VENEER TAPE

is made of highest quality Kraft Paper that peels off your veneer in one piece, thus eliminating that tedious and expensive work of sanding or scraping.

YOUR especial needs of Veneer Tapes, whether Paper or Cloth, can be furnished by

The Gummed Products Co.

Troy - Ohio

Chicago Minneapolis New York

CANADIAN · NASHUA · PAPER · CO. · LTD
SERVICE PRODUCTION QUALITY
NASHUA
TRADE MARK
PETERBOROUGH ONT.

NASHUA Veneer Tapes

Are manufactured with a view to giving the consumer the material for his purpose, and we stand ready to develop any special requirement for you.

In purchasing our tapes, you are assured of prompt service, guaranteed quality and a reasonable price.

Samples of our stock will be sent upon request, so that you may try them out in your plant in a practical way.

CLOTH and PAPER
Guaranteed Veneer Tapes

THE CANADIAN NASHUA PAPER CO., Ltd.

Peterborough, Ont.

An Efemco Product

They Look Good— and Work Better

Efemco Acme Grip Neck Casters impove appearance and increase mobility. Because of their smooth free action, strong axles and compact, sturdy construction, they meet the demands of furniture manufacturers and all users of good casters.

Acme Grip Neck Casters are one of the biggest selling items of the EFEMCO line. They are made in sizes 3, 4, 5, 6, and 7, with Maple, Lignum Vitae, Steel, Iron and Fibe wheels—brass-plated, nickel-plated or non-plated —for furniture of all styles and grades.

Write for catalog showing new lines of improved EFEMCO Casters.

FOSTER, MERRIAM & CO.

Meriden, Conn. Hamilton, Ontario New York City

Efemco PRODUCTS

Grip Neck Casters
Ball Bearing Casters
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Standardized by 85 years of service

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"Williams" Woodworking Machinery

If It's Machinery—Write "WILLIAMS"

An Exceptional Opportunity to Save Money on High Grade Woodworking Machinery

We have just purchased the complete equipment of the NORTH BAY TOY COMPANY, which was very slightly used, consisting of YATES Moulders, Straight Edge Rippers and Shapers, MATTISON and WAYMOTH Variety Lathes, PRESTON High Speed Ball-bearing Shapers and Band Saws, and a number of other well-known high grade lines. Send us your list of requirements or phone Woodworking Dept., Ad. 20.

THE PRICES ARE ATTRACTIVE

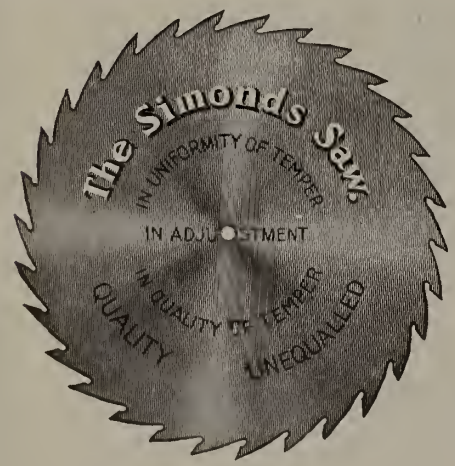
The A. R. Williams Machinery Co., Limited

64 FRONT ST. WEST - TORONTO

Phone Woodworking Machinery Dept., Adelaide 20

Full lines of Iron and Wood-Working Machinery, Boilers, Engines and Contractors' Machinery, Electric Motors, Saws, Shingle and Lath Mill Machinery, etc.

HALIFAX, N.S. ST. JOHN, N.B. MONTREAL, P.Q. TORONTO, ONT. VANCOUVER, B.C. WINNIPEG ,MAN.



SIMONDS
SAWS and KNIVES

Are made right. Every operation from the making of the steel to the finishing and packing is watched by experienced workmen. The latest appliances known to the metal trades are used to insure the quality of SIMONDS Saws and Knives. After each operation they are inspected by experts for defects in quality and workmanship. The result—as good a saw as human skill and science can make. Prove it to your own satisfaction. Let us quote you on the tools you need.

Simonds Canada Saw Co.
LIMITED

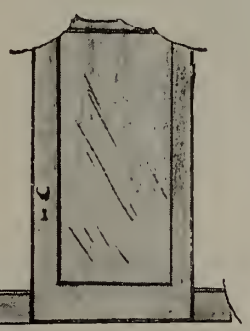
St. John, N.B. MONTREAL, Que. Vancouver, B.C.

ALGOMA
PANEL COMPANY

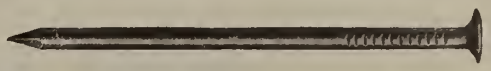
We manufacture from the log to the finished panel

Specialize on
DOOR PANELS, FURNITURE AND FIXTURE PANELS

Birch, Plain and Qtd. Oak, Mahogany Walnut and Figured Grain



ALGOMA PANEL CO.
Manufacturers Since 1886
ALGOMA, WIS. - U.S.A.



NAILS AND WIRE
For Every Need in the Woodworking Industry

Bale ties, Nails and Wire of every description are manufactured by us. We manufacture to your order.

Laidlaw Bale-Tie Co., Ltd.

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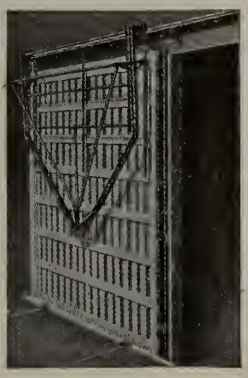
Head Office and Works: HAMILTON, CANADA

The Door Carrier System



Makes your dry-kiln doors steam-tight and saves time, heat, trouble and money.

Carrier lifts door clear of kiln and carries it down track. Returning, deposits door to rabbeted joint, where it is held steam-tight by its own weight. Applicable to old or new kilns.
Ask for catalogue.

DRY KILN DOOR CARRIER CO.
1117 Cornell Ave.
INDIANAPOLIS, IND.

VENEERS DOORS PANELS

BLUE DIAMOND NEENAH

Wood Products

ROTARY CUT SINGLE PLY GUM and POPLAR	DESK and TABLE TOPS in all WOODS	THREE and FIVE PLY PANELS in all WOODS	VENEERED and SOLID DOORS STANDARD and SPECIAL

Manufactured by

Hardwood Products Company

NEENAH, WISCONSIN

THIS IS THE NAME

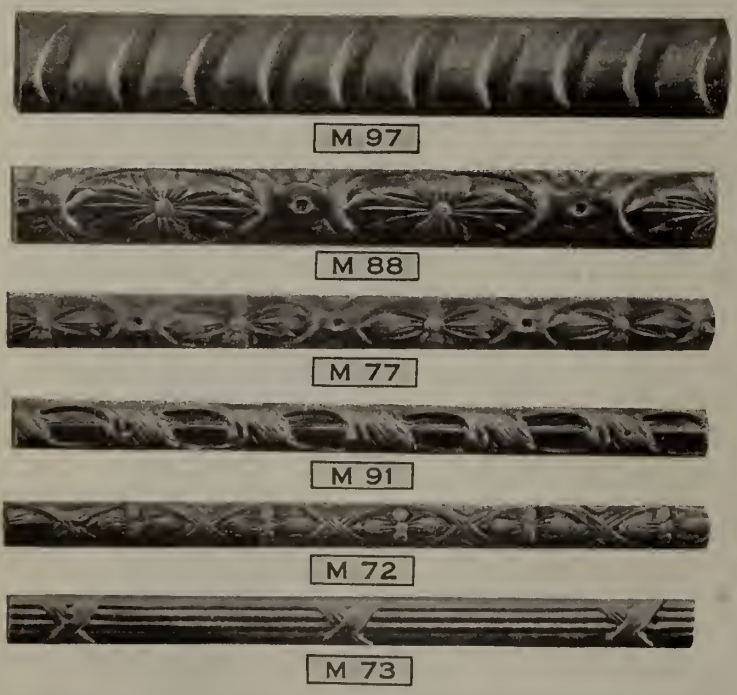
of the Machinery for the Rapid Production of

Veneer—Crates—
Baskets—Fruit Packages.

"ST JOE"

Get the name fixed in your mind.

ST. JOSEPH IRON WORKS, St. Joseph, Michigan



MOULDINGS We are making more Period Mouldings than ever before. Orders should be placed early to assure your supply when needed.

KNOBS The Period Knobs we placed on the market a few months ago are proving very popular. If you have not received samples ask for them now.

ROSETTES A new Period item to accompany the knobs.

Waddell Manufacturing Company

Coldbrook and Taylor, N. W. Grand Rapids, Mich.

Don't be Fooled about Fire Insurance

Fire insurance is one of the most important things you buy but that is no reason you should pay double price for it.

For the past twelve years we have written fire insurance on most of the large Canadian woodworking and lumber plants without an argument at the time of loss adjustment and we have saved these manufacturers thousands of dollars in their insurance costs.

We make our own rates, we are licensed in Canada and we give you a service that will hold your business as long as you have insurance to place.

We confine our business to lumber yards and woodworking plants, where the physical hazard and financial standing will meet with our rules of eligibility.

Perhaps we can only write a part of your insurance, depends upon the size of the plant, but it costs you nothing to take the matter up with us and it may be a big saving in insurance cost to you.

Address all communications to

LEE BLAKEMORE, Inc., 942 McCormick Bldg., CHICAGO, Illinois

ATTORNEY IN FACT for the

Manufacturing Woodworkers' Underwriters

Send for a list of plants on which we carry insurance. We have a local representative in each province who will call on you upon request

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OAKEY'S

Glass Paper, Flint Sand Paper, Garnet Paper

IN SHEETS AND ROLLS FOR ALL PURPOSES

Rolls 50 yards long, 18 in., 20 in., 24 in., 30 in., 36 in., 40 in., 42 in. and 48 in., wide

SHEETS, DISCS, STRIPS AND BANDS can be made to Special Sizes to suit the requirements of Purchasers

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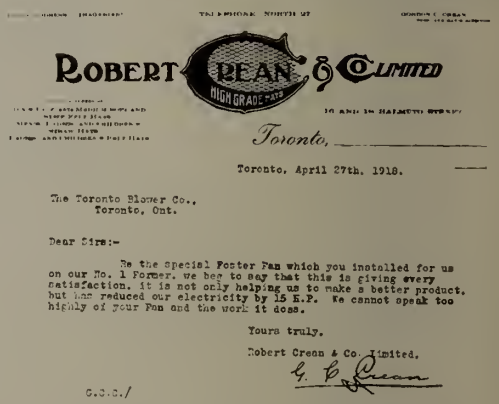
Here is the Proof →

This is conclusive proof of the efficiency of the FOSTER FAN under an unusually severe test.



ROBERT REAN & CO LIMITED
HIGH GRADE

Toronto, _____

Toronto, April 27th, 1918.

The Toronto Blower Co.,
Toronto, Ont.

Dear Sirs:-

Re the Special Foster Fan which you installed for us on our No. 1 Former, we beg to say that this is giving every satisfaction. It is not only helping us to make a better product, but has reduced our electricity by 15 H.P. We cannot speak too highly of your Fan and the work it does.

Yours truly,
Robert Crean & Co. Limited,
G. B. Crean

G.B.C./

We are Specialists

We design, install and guarantee our systems from the making of the fan right down to the finest detail of installation.

PATENTED

← THIS IS THE FAN THAT SAVED 15 H.P.

The "Foster Fan"—the heart of our blower systems—is of special design, being the only non-centre suction fan on the market.

It will handle any conceivable material continuously—without clogging, and is the only suction fan having a bearing on the inlet side, thereby eliminating the over-hung wheel. These fans are equipped with special ball bearings, and if desired are also equipped with special ball bearing loose pulley.

Let us demonstrate the most satisfactory exhaust system in Canada.

Toronto Blower Company
156 Duke Street TORONTO, Ont.

Here's a Suggestion

Do you ever try keeping a file of your back copies of the "Canadian Woodworker"? Try it. Start with this issue. There are many articles that are worth keeping, as they offer valuable suggestions that will help you in your business.

Dry Stock for Immediate Shipment

4/4 Birch	No. 1 C & B	or	No. 2 C & B
6/4 Birch	No. 1 C & B	or	No. 2 C & B
8/4 Birch	No. 1 C & B	or	No. 2 C & B
10/4 Birch	No. 1 C & B	or	No. 2 C & B
12/4 Birch	No. 1 C & B	or	No. 2 C & B
4/4 6/4 8/4 Basswood			No. 2 C & B
4/4 and 12/4 Maple			No. 2 C & B
4/4 Beech			No. 2 C & B
4/4 Black Ash			No. 2 C & B

Buy now and forestall shortages

EDWARD CLARK & SONS LIMITED

807-9 BANK OF HAMILTON BUILDING - TORONTO, Ontario

SOUTHERN HARDWOODS

Dry Lumber in Buffalo for Quick Shipment

TENNESSEE SCENTED CEDAR

1 in. 92,700′ No. 1 Com. & Btr.
1¼ in. 5,000′

CHERRY

	1&2	Clear Strips	No. 1 Com.	No. 2 Com.
1 in.	157,500	200	182,200	128,500
1¼ in.	3,500	......	21,600	2,500
1½ in.	10.000	......	37,700	26,300
2 in.	7,000	......	21,200	64,900
2½ in.	6,500	......	3,700	2,200
3 in.	28,700	......	3,500	3,300
4 in.	5,900	......	......	500

CHESTNUT

	1&2	Clear Strips	No. 1 Com.	S.W.& No. 2 Com.
¾ in.	1,000	......	51,000	103,000
1 in.	......	665	4,300	163,500
1¼ in.	171,800	300	89,200	199,200
1½ in.	51,500	......	52,000	......
2 in.	22,200	......	17,300	126,200
2½ in.	4,000	......	1,500	500
3 in.	2,100	......	1,300	500
4 in.	1,500	......	300	......

PLAIN RED GUM

		1&2	No. 1 Com.	No. 2 Com.
1 in.	......	25,300	13,000	.15,500
1¼ in.	......	......	325	......
1½ in.	......	......	4,300	9,500
2 in.	......	......	......	7,500

QUARTERED RED GUM

	1&2	No. 1C	No. 2C
4/4	6,000	20,000	12,100
5/4	5,100	3,800	......
6/4	3,900	4,500	......
8/4	19,100	7,500	3,600

QUARTERED SAP GUM

	1&2	No. 1C	No. 2C
4/4	......	2,500	12,000
5/4	14,000	......	......
8/4	2,000	......	......
10/4	350	24,000	3,000

SAP GUM

		1&2	No. 1 Com.	No. 2 Com.
1 in.	......	3,400	6,000	200
1¼ in.	......	......	400	......
1½ in.	......	2,400	6,000	13,500
2 in.	......	......	5,700	10.400
2½ in.	......	......	......	......

PLAIN RED OAK

⅜ in.	24,200	......	......	......
¾ in.	104,000	......	124,000	33,200
⅝ in.	......	......	84,000	53,600
1 in.	95,200	3,550	133,000	142,400
1¼ in.	90,700	2,400	13,000	......
1½ in.	168,900	4,300	68,200	40,000
2 in.	148,100	......	180,800	71,000
2½ in	78,100	......	24,000	3,700
3 in.	28,800	......	20,500	7,000
4 in.	18,600	......	8,900	......

PLAIN WHITE OAK

	1&2	Clear Strips	No. 1 Com.	No. 2 Com.
⅝ in.	10,150	......	500	16,900
¾ i...	142,900	......	251,000	83,000
1 in.	16,300	1,700	129,000	85,200
1¼ in.	28,300	......	4,500	5,000
1½ in.	111,500	......	72,000	18,000
2 in.	94,000	......	131,000	65,000
2½ in.	176,800	......	56,500	3,000
3 in.	106,800	......	65,800	14,400
3½ in.	5,500	......	3.000	1,500
4 in.	77,000	......	22,500	6,000

QUARTERED RED OAK

	1&2	Clear Strips	No. 1 Com.	No. 2 Com.
¾ in.	1,700	......	9,700	400
1 in.	24,200	5,400	10,500	1,400
1¼ in.	3,000	......	3,000	500
1½ in.	......	......	......	......
2 in.	1,000	......	7,400	......

QUARTERED WHITE OAK

	1&2	Clear Strips	No. 1 Com.	No. 2 Com.
½ in.	6,500	......	......	......
¾ in.	550	300	23,600	9,000
⅝ in.	2,800	......	5,500	800
1 in.	57,400	18,000	61,400	27,000
1¼ in.	700	......	300	......
1½ in.	3,500	......	400	......
2 in.	......	......	25,100	5,700
2½ in.	1,000	......	......	......

POPLAR

	1&2	No. 1 Com.	No. 2 Com.	Bright Sap
⅝ in.	10,800	41,300	600	20,800
1 in.	42,000	208,900	127,000	23,200
1¼ in.	4,300.	700	30,000	4,000
1½ in.	......	17,000	20,500	......
2 in.	6,600	5,500	24,500	1,800
2½ in.	4,800	......	......	......
3 in.	30,900	12,000	47,000	3,600
4 in.	......	......	450	......

BLACK WALNUT

		1&2	No. 1 Com.	No. 2 Com.
1 in.	......	1,200	......	14,400
1¼ in.	......	2,200	21,300	1,200
1½ in.	......	125	200	100
2 in.	......	100	4,500	1,900
2½ in.	. ....	......	145	45
3 in.	......	110	50	250
4 in.	......	......	500	1,200

Also Large Stocks of Ash, Basswood, Beech, Birch, Hard and Soft Maple.

THE ATLANTIC LUMBER CO., 310 Manning Chambers, Toronto

MANUFACTURERS SOUTHERN HARDWOOD LUMBER

Yards: BUFFALO, N.Y. Mills: KNOXVILLE, TENN.; FONDE, KENTUCKY

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We specialize in the following Crating lumbers
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We can furnish you immediately Factory Stock including all grades and thicknesses of

Walnut, Chestnut
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Oak, Maple, Walnut and other Fancy Woods

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Information furnished as to the qualities, weights, strengths, and uses of all woods

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for Prompt Shipment

WHITE ASH

11,000′	4/4	No. 2 C&B

BROWN ASH

60,000′	4/4	No. 1 C&B
16,000′	6/4	No. 1 C&B
8,900′	8/4	No. 1 C&B

BASSWOOD

75,000′	4/4	Sel. & Fas.
100,000′	4/4	No. 1 & 2. Com.
75,000′	6/4	No. 1 Com. & FAS
50,000′	6/4	No. 2 Com.
40,000′	8/4	No. 1 C&B

MAPLE

75,000′	4/4	Log Run

BEECH

65,000′	4/4	Log Run

BIRCH

30,000′	4/4	FAS
90,000′	4/4	No. 1 Com.
150,000′	4/4	No. 2 Com.
30,000′	5/4	No. 1 Com. & FAS
45,000′	6/4	FAS
60,000′	6/4	No. 1 Com.
75,000′	6/4	No. 2 Com.
100,000′	8/4	Sel. & Fas.
150,000′	8/4	No. 1 Com.
100,000′	8/4	No. 2 Com.
75,000′	10/4	Sel. & Fas.
125,000′	10/4	No. 1 Com.
250,000′	12/4	Sel. & Fas.
100,000′	16/4	Sel. & Fas.

SOFT ELM

45,000′	4/4	No. 2 C&B
21,000′	6/4	No. 1 C&B
22,000′	8/4	No. 1 C&B

150,000′ 4/4 Basswood, Birch, Ash, Elm No. 3 Com. Under National Rules.

Hardwood Dowels

Plain, Straight and Spiral Grooved

"Canada Wood" dowels are manufactured from high-grade Maple, Birch, Beech or White Oak, uniform in length and nicely pointed, quality guaranteed.

We also manufacture Bailwoods and Variety Turnings in all styles, sizes and descriptions, in the plain, or Enamelled in Black, Natural Wood or Mahogany finishes. Three-eighth in. Maple, Birch and Quarter Cut White Oak Flooring a Specialty. Broom and Mop Handles of every description.

Canada Wood Specialty Co. Limited

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Sawmills at Zebra and Orillia, Ont.
Cable Address: "Special," Orillia, Can.

Anderson, Shreiner & Mawson

Phone Main 1604 WHOLESALE LUMBER 43 Victoria St., TORONTO

Birch, Maple, Elm, Ash and Basswood

Write or "Phone" for Prices. **Mills at South River, Ont.**

We Can Supply

full or mixed cars for immediate shipment. All grades and sizes of

Hard & Soft Maple
Rock & Soft Elm
Beech & Birch
Basswood
Hardwood, in 4x4, 4x6, 1" & 2" No. 3 Com.

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The Pedwell Hardwood Lumber Company

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Stock on Hand in Kitchener for Immediate Shipment

3,000	ft.	4/4 x 10 in. and up Qt'd White Oak Fas.
12,000	"	4/4 x 6 in. and up Qt'd White Oak Fas.
15,000	"	4/4 x 6 in. and up Qt'd White Oak No. 1 com.
2,680	"	3/4 x 13/17 Sap Gum Fas.
4,700	"	3/4 x 3/12 Sap Gum No. 1 Com.
400	"	5/4 x 6 in. Plain red Gum Fas.
4,000	"	4/4 x 6 in. up Sap Gum No. 1 Com.
5,000	"	8/4 x 6 in. up Qt'd red Gum C. & B.
8,000	"	5/4 x 6 in. Plain White Oak Fas. ... ...
2,000	"	6/4 x 4 in. Plain White Oak No. 1 Com.
15,000	"	6/4 x 6 in. Plain red Oak Fas.
10,000	"	8/4 x 6 in. Plain red Oak Fas.
25,000	"	8/4 x 4 in. Plain red Oak No. 1 Com.
12,000	"	4/4 x 3 in. Tenn. Red Cedar No. 1 C. & B.
25,000	"	8/4 Sound Wormy Chestnut
2,000	"	5/4 Sount Wormy Chestnut
32,000	"	6/4 Sound Wormy Chestnut
5,000	"	4/4 Chestnut No. 1 C. & B.
10,000	"	5/4 Chestnut No. 1 C. & B.
10,000	"	6/4 Chestnut No. 1 C. & B.
43,000	"	4/4 Soft Elm No. 3 C. & B.
1,000	"	4/4 Soft Elm No. 3 Common
12,000	"	8/4 Soft Elm No. 2 C. & B.
15,000	"	12/4 Soft Elm No. 2 C. & B.
5,285	"	12/4 Oak No. 2 Common & Better
6,000	"	12/4 Oak No. 2 and 3 Common
12,000	"	4/4 Hard and soft Maple No. 3 C. & B.

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Office: 298 Breithaupt St., KITCHENER, ONT.

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MANUFACTURERS OF HIGH GRADE WOOD PRODUCTS

Wood Turnings, Hardwood Dowels, Turned Table Legs, Kitchen Tables, Kitchen Cabinets, Oak Extension Tables, Oak Library Tables, "Empire Brand" Hardwood Flooring in Maple, Birch, and Plain or Quarter Cut Oak, Solid Pine and Veneered Hardwood Doors.

A Large Factory equipped with up-to-date machinery is at your service to furnish "WHAT YOU WANT"— WHEN YOU WANT IT."

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Orillia Ontario Canada

ESTABLISHED 1867 OTIS TRADE MARK INCORPORATED 1886

MAHOGANY
The King of Woods

The above photograph shows many thousands of feet of this regal lumber in our yards. Hewn from the jungles of the tropics, escorted along many miles of inland river to the sea, by chattering, singing black men, then shipped to our mills; this, in brief, is the story of the King of the woods. Mahogany.

WE ARE MANUFACTURERS AND IMPORTERS OF

Tabasco, Laguna, Honduras, and Mexican Mahogany

The Otis mills have a capacity of 12,000,000 feet per year. This assures our customers that we possess an adequate supply. Write for our quotations.

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OAK
or
Mahogany
TOPS —
PANELS
Gorham Brothers Company
Mount Pleasant, Michigan

A Quality and Service Standard Three generations old

The Gorham Standard has always been a quality standard. Our organization is trained to know quality and to build quality into our entire product.

Manufacturers of high grade furniture can increase their output considerably by using Gorham Quality Tops, Panels, Desk Beds, and other forms of built-up stock.

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We specialize in

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White and Red Oak
Yellow Poplar
Basswood
Chestnut and
Gum Lumber.

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Manufacturers Southern Hardwoods

Band Mill and Office - Memphis, Tenn.

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2 cars 5/4 No. 2 Com. & Btr.

CYPRESS
1 car 4/4 Shop & Btr.

ELM
3 cars 6/4 Log Run
1 car 8/4 Log Run
1 car 12/4 Log Run

PLAIN RED GUM
1 car 4/4 Com. & Btr.
1 car 5/4 Com. & Btr.
2 cars 4/4 No. 1 Common
2 cars 4/4 No. 2 Common

QTD. RED GUM
2 cars 4/4 No. 1 Common
1 car 6/4 F.A.S.
1 car 6/4 No. 1 Common
1 car 8/4 Com. & Btr.

QTD. RED GUM S.N.D.
2 cars 8/4 No. 1 & Btr.
1 car 10/4 No. 1 & Btr.
1 car 12/4 No. 1 & Btr.

PLAIN SAP GUM
1 car 4/4 F.A.S.
3 cars 4/4 No. 1 Com.
3 cars 4/4 No. 2 Com.
2 cars 4/4 No. 3 Com.
1 car 5/4 Com. & Btr.
2 cars 5/4 No. 2 Com.
1 car 5/4 No. 3 Com.

QTD. BLACK GUM
3 cars 4/4 No. 1 Com. & Btr.
1 car 4/4 No. 2 Com.

PLAIN BLACK GUM
1 car 4/4 Log Run

HICKORY
1 car 6/4 Log Run

QTD. WHITE OAK
2 cars 4/4 No. 1 & Btr.
3 cars 4/4 No. 1 Com.
1 car 4/4 No. 2 Com.
1 car 4/4 2½ to 5½ Cl. Strips
1 car 4/4 1½ to 3 Com. Strips.
2 cars 5/4 No. 1 & Btr.
1 car 6/4 No. 1 Com.

PLAIN WHITE OAK
3 cars 4/4 No. 1 Com.
1 car 4/4 No. 2 Com.
1 car 4/4 No. 1 Com. & Btr. Sound Wormy
1 car 5/4 No. 1 Com. & Btr.
1 car 5/4 No. 1 Com.
1 car 6/4 No. 1 Com.
1 car 5&6/4 No. 3 Com.

PLAIN RED OAK
3 cars 3/4 No. 1 Com. & Btr.
1 car 4/4 No. 1 Com. & Btr.
3 cars 4/4 No. 1 Com.
2 cars 4/4 No. 2 Com.
2 cars 5/4 No. 1 Com. & Btr.
1 car 5/4 No. 1 Com.
1 car 6/4 No. 1 Com. & Btr.

POPLAR
1 car 4/4 F.A.S.
1 car 4/4 Saps & Select
2 cars 4/4 No. 1 Com.
2 cars 4/4 No. 2 Com.
1 car of Dogboards.

Dacus-Richards Hardwood Co.

A. P. DACUS - H. J. RICHARDS

MANUFACTURERS

Southern Hardwood

Specializing in

RED GUM
SAP GUM

PLAIN AND QUARTERED

OAK

Randolph Building,
Memphis, Tennessee.

Mills at EVANSVILLE, Miss., and PRITCHARD, Miss.

Perkins Brothers

Kelso, Ark.

Manufacturers of

Southern Hardwoods

Quartered and Plain White Oak, Plain Red Oak, Gum Elm, Maple, Ash and Cypress

We are also prepared to cut dimension stock to order in Ash, Oak, Gum, Hickory and Elm.

Let us know your requirements.

Brown & Hackney, Inc.

MEMPHIS, TENN.

BAND MILL · LITTLE ROCK, ARK.

Manufacturers of High Grade

Band Sawn Southern Hardwood

LUMBER

General Office:

Bank of Commerce Bldg. Memphis, Tenn.

MARCH, 1921—Stock List

QUARTERED WHITE OAK

2 cars	5/8"	No. 1 Common
2 cars	4/4"	1s&2s
5 cars	4/4"	No. 1 Common
2 cars	4/4"	No. 2 Common
2 cars	4/4"	Common Strips
7,000'	6/4"	No. 1 Common
8,000'	8/4"	No. 1 Common
1 car	8/4"	No. 2 Common

PLAIN RED OAK

1 car	3/4"	1s&2s
2 cars	3/4"	No. 1 Common
1 car	3/4"	No. 2 Common
2 cars	4/4"	No. 1 Common
2 cars	4/4"	No. 2 Common

PLAIN WHITE OAK

1 car	4/4"	1s&2s
4 cars	4/4"	No. 1 Common
2 cars	4/4"	No. 2 Common
2 cars	5/4"	Common

MIXED OAK

3 cars	3/4"	No. 3 Common
4 cars	4/4"	No. 3 Common
2 cars	4/4"	Sound Wormy
1 car	3/4"	Sound Wormy

BLACK GUM

3,000'	3/4"	No. 1 Common & Better Plain
2 cars	4/4"	No. 1 Common & Better Plain
2 cars	8/4"	No. 1 Common & Better Quartered

QUARTERED RED OAK

6,000'	8/4"	No. 2 Common & Better

PLAIN SAP GUM

3 cars	3/4"	No. 1 Common & Better
3 cars	5/8"	No. 1 Common & Better
2 cars	5/8"	No. 2 Common
2 cars	6/4"	& 8/4" Dog Boards

QUARTERED RED GUM SAP NO DEFECT

3 cars	4/4"	No. 1 Common & Better
3 cars	5/4"	No. 1 Common & Better
5 cars	6/4"	No. 1 Common & Better
5 cars	8/4"	No. 1 Common & Better

PLAIN RED GUM

1 car	4/4"	No. 1 Common & Better

QUARTERED RED GUM

2 cars	4/4"	No. 1 Common & Better
2 cars	6/4"	No. 1 Common & Better
2 cars	8/4"	No. 1 Common & Better

MISCELLANEOUS

2 cars	4/4"	No. 1 Shop Cypress
1 car	6/4"	No. 2 Common Elm
1 car	4/4"	Common & Better Cottonwood
1 car	4/4"	Log Run Sycamore

Wire or write for delivered prices. We can make immediate shipment on RUSH orders. Can load same day as we receive shipping instructions.

MEMPHIS BRUCE LITTLE ROCK

WHITE OAK

of excellent quality and expert manufacture.

Also

RED OAK
ASH · GUM

All Band Sawn

Produced in our new hardwood mill at Little Rock, Arkansas. The last word in modern equipment.

We can ship Oak Flooring, Square-Edged Parquetry Strips, Trim and Moldings with Hardwood lumber—a service of unusual advantage to the trade.

Write Now

E. L. BRUCE COMPANY

LITTLE ROCK

HARDWOOD PLANT, Little Rock

FLOORING PLANTS, Little Rock and Memphis

BEDNA YOUNG
Lumber Company
Jackson - Tennessee

Manufacturers of

Quartered White Oak
Quartered Red Oak
and Other Hardwoods

When in the market for
High Grade Lumber
please let us have your enquiries.

Sawed Veneer

Quartered White Oak
For Furniture and Panels

Plain Red Oak
For Interior Trim and Doors

Cypress
For Battery Separators

Manufacturing Uniformly Good.
Quality Unsurpassed

James E. Stark & Co., Inc.
MEMPHIS, TENN.

Are You Prepared For a Lumber Famine?

THE present situation among manufacturers, according to market reports, shows that Hardwood Stocks are far short of normal.

To those in close touch with the Lumber industry, there are positive signs pointing to a change in the lumber situation—values are bound to stiffen.

Prices are now at rock-bottom—this will not last. A sudden demand will shoot prices up again.

Just look over YOUR requirements for Birch, Basswood, Hard Maple, or Elm, now—and get quotations from us without delay.

Sawyer Goodman Company
Marinette - Wisconsin

Stimson Veneer and Lumber Co.

(Inc.)

Office and Mill: McLean Ave. and Union Belt R.R.

Memphis - Tenn.

We sell only the product of our own mills and make band sawn lumber in all Southern Hardwoods.

We specialize in Quartered White Oak, Red Oak, and Red Gum.

With allied companies we make fifty million feet annually.

J. V. Stimson Hardwood Co.

Manufacturers and Exporters

Band Mills: Memphis, Tenn., Helena, Ark.

Memphis - Tenn.

STOCK LIST

QUARTERED WHITE OAK
- 3 cars 4/4" 1s and 2s.
- 5 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common .

QUARTERED RED OAK
- 5 cars 4/4" 1s and 2s.
- 10 cars 4/4" No. 1 Common.
- 4 cars 4/4" No. 2 Common.
- 2 cars 6/4" No. 1 Common and Better.

QUARTERED RED GUM
- 10 cars 4/4" 1s and 2s.
- 3 cars 4/4" 1s and 2s Fig.
- 2 cars 5/4" 1s and 2s.
- 2 cars 6/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 2 cars 5/4" No. 1 Common.
- 2 cars 6/4" No. 1 Common.

QUARTERED RED GUM, Sap no Defect
- 5 cars 6/4" No. 1 Common and Better.
- 10 cars 8/4" No. 1 Common and Better.

ASH
- 4 cars 10/4" No. 1 Common and Better.
- 1 car 12/4" No. 1 Common and Better.
- 1 car 6/4" No. 1 Common and Better.
- 2 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common.

SAP GUM
- 10 cars 4/4" 1s and 2s.
- 20 cars 4/4" No. 1 Common.
- 10 cars 4/4" No. 2 Common.
- 2 cars 4/4" 18" up Panel.
- 5 cars 4/4" 13-17" Box Boards.

PLAIN RED OAK
- 2 cars 4/4" 1s and 2s.
- 2 cars 6/4" No. 1 Common and Better.
- 2 cars 10/4" No. 1 Common and Better.

PLAIN WHITE OAK
- 4 cars 4/4" No. 1 Common Plain.

COTTONWOOD
- 2 cars 4/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 5 cars 4/4" No. 2 Common.

ELM
- 2 cars 4/4" Log Run.
- 10 cars 10/4" Log Run.
- 10 cars 12/4" Log Run.

MAPLE
- 4 cars 12/4" Log Run.

We are pleased to offer the following thoroughly dry, choice band sawn stock for prompt shipment. Highly attractive delivered prices cheerfully quoted upon request. Phone, wire or write for quotations.

QUARTERED WHITE OAK

12M	4/4	FAS	
65M	5/4	FAS	
30M	6/4	FAS	
180M	4/4	No. 1	Com.
100M	5/4	No. 1	Com.
250M	6/4	No. 1	Com.
70M	8/4	No. 1	Com.
25M	4/4	No. 2	Com.
20M	5/4	No. 2	Com.
15M	6/4	No. 2	Com.
2M	5/4	No. 3	Com.
10M	6/4	No. 3	Com.

QTD. WHITE OAK STRIPS

90M	4/4	C&B	1½—4½
2M	5/4	C&B	1½—4½
3M	6/4	C&B	1½—4½

PLAIN WHITE OAK

12M	4/4	FAS	
9M	6/4	FAS	
60M	4/4	No. 1	Com.
20M	5/4	No. 1	Com.
80M	6/4	No. 1	Com.

QUARTERED RED OAK

1M	3/4	FAS	
4M	4/4	FAS	
45M	5/4	FAS	
2M	6/4	FAS	
85M	4/4	No. 1	Com.
100M	5/4	No. 1	Com.
25M	6/4	No. 1	Com.

PLAIN RED OAK

20M	4/4	FAS	
20M	6/4	FAS	
250M	4/4	No. 1	Com.
200M	5/4	No. 1	Com.
100M	6/4	No. 1	Com.
15M	4/4	No. 2	Com.
20M	5/4	No. 2	Com.
20M	6/4	No. 2	Com.
2M	8/4	No. 2	Com.
175M	4/4	No. 3	Com.
40M	5/4	No. 3	Com.
50M	6/4	No. 3	Com.

QUARTERED SYCAMORE

20M	4/4	No. 2	C&B

SOUND WORMY OAK

250M	4/4	
80M	5/4	
35M	6/4	

QUARTERED RED GUM

3M	4/4	FAS	
5M	6/4	FAS	
40M	8/4	C&B	
25M	4/4	No. 1	Com.
9M	6/4	No. 1	Com.
20M	8/4	No. 1	Com.

PLAIN RED GUM

25M	4/4	FAS	
13M	5/4	No. 1	Com.
2M	6/4	No. 1	Com.
70M	4/4	No. 2	Com.

QUARTERED RED GUM
(Sap No Defect)

200M	6/4	C&B	
300M	8/4	C&B	
300M	10/4	C&B	
250M	12/4	C&B	
9M	6/4	No. 2	Com.
12M	8/4	No. 2	Com.
5M	10/4	No. 2	Com.
5M	12/4	No. 2	Com.

PLAIN SAP GUM

3M	6/4	FAS	
125M	4/4	No. 1	Com.
50M	5/4	No. 1	Com.
70M	6/4	No. 1	Com.
45M	4/4	No. 2	Com.
100M	6/4	No. 2	Com.
25M	4/4	No. 3	Com.
5M	5/4	No. 3	Com.
6M	6/4	No. 3	Com.
100M	8/4	No. 3	Com.

ASH

20M	8/4	C&B	
125M	10/4	C&B	
15M	12/4	C&B	
15M	16/4	C&B	
2M	4/4	No. 1	Com.
75M	5/4	No. 1	Com.
35M	6/4	No. 1	Com.
15M	5/4	No. 2	Com.
4M	6/4	No. 2	Com.
15M	5/4	No. 3	Com.

COTTONWOOD

8M	4/4	FAS	
175M	4/4	No. 1 & 2	Com.
15M	4/4	No. 2	Com.
30M	4/4	No. 2 & 3	Com.

CYPRESS

2M	6/4	Shop	
18M	6/4	No. 1	Com.
3M	6/4	No. 2	Com.

ELM

8M	4/4	No. 2	C&B
75M	8/4	No. 2	C&B
100M	10/4	No. 2	C&B
40M	12/4	No. 2	C&B
15M	16/4	No. 2	C&B
30M	10/4	No. 1	Com.

TUPELO GUM

30M		wd bx bds	
150M	4/4	C&B	
5M	5/4	C&B	
14M	6/4	C&B	
50M	4/4	No. 2	Com.

POPLAR

2M	4/4	saps & sel.	
40M	4/4	No. 2 Com.	A&B

MAPLE

15M	4/4	No. 2	C&B
35M	10/4	No. 2	C&B

LOCUST

4M	4/4	No. 2	C&B

HACKBERRY

6M	4/4	No. 2	C&B

WIRE FOR DELIVERED PRICES AT OUR EXPENSE.
DIRECT FROM PRODUCER TO CONSUMER

GAYOSO LUMBER COMPANY

MEMPHIS, TENNESSEE U.S.A.

Canadian Representative:

W. R. YOUMANS, 972 College Street., Toronto, Ont.

Telephone, Parkdale 6751-W.

WHEELER - TIMLIN LUMBER CO.

WAUSAU, Wisconsin.

You cannot beat the Birch for an all round wood for the furniture manufacturer. We have BEAUTIFUL BIRCH in all standard thicknesses from 4/4″ to 10/4″ and all grades. Write us for delivered prices.

Mills at DORCHESTER, Wis., and WITTENBERG, Wis.

F. T .DOOLEY, President. T. E. JONES, Secy.-Treas.

F. T. Dooley Lumber Co.
Inc.

MANUFACTURERS and WHOLESALERS of

SOUTHERN HARDWOODS

Plain and Quartered Oak
Cypress, Gum, Ash
Soft Maple and Elm

Send us your inquiries

Memphis ∴ ∴ Tennessee

Chas. F. Luehrmann Hardwood Lumber Co.

Manufacturers and Wholesalers of

Hardwood and Yellow Pine Lumber

Office and Yard: 148 Carroll St. St. Louis, Mo.

Hardwood and Yellow Pine for Immediate Shipment from Stock

Complete Stock of Built Up Panels
3 and 5 Ply—Carried in Stock at St. Louis

FIR DRAWER BOTTOMS
FIR DOOR PANELS

Write us for our Stock and Price List

Aromatic Tennessee Red Cedar

CAR LOAD LOTS OR LESS

Earthman Lumber Co.
Murfreesboro, Tenn.

Quality plus Service
AT RIGHT PRICES

Let us quote you on concave chair seat, turned office, piano, restaurant and bath-room stool tops.

Solid table tops, cabinet work; in fact woodwork of all description.

Algoma Wood Products Co.
ALGOMA, WIS.

Band Sawn Poplar, Plain and Quartered White and Red Oak— Quartered Red Gum, Sap No Defect

Below we offer, subject to prior sale and immediate acceptance, the following stock:—

ASH

4/4"	Log Run	20,000 ft.
5/4"	Log Run	4,000 "
6/4"	Log Run	2,000 "
8/4"	Log Run	5,000 "

BASSWOOD

4/4"	No. 2 Com. & Btr.	35,000 "

BEECH

4/4"	Log Run	10,000 "
8/4"	Log Run	40,000 "
10/4"	Log Run	10,000 "
12/4"	Log Run	3,000 "

COTTONWOOD

4/4"	Log Run	10,000 "

QTRD. GUM, SND

4/4"	No. 2 Com. & Btr.	7,500 "
6/4"	FAS	20,000 "
6/4"	No. 1 Com.	40,000 "
8/4"	No. 1 Com.	30,000 "

PLAIN SAP GUM

4/4"	No. 1 Com.	45,000 "
4/4"	No. 2 Com.	30,000 "
5/4"	No. 1 Com. & Btr.	30,000 "

QTRD. BLACK GUM

4/4"	No. 2 Com. & Btr.	45,000 "

PLAIN BLACK GUM

4/4"	No. 1 Com. & Btr.	15,000 "

HICKORY

6/4"	Log Run	2,000 "
8/4"	Log Run	12,000 "

QTRD. WHITE OAK

4/4"	FAS	15,000 ft.
4/4"	No. 1 Com.	84,000 "
4/4"	No. 2 Com.	74,000 "
5/4"	Com. & Btr.	10,000 "

MAGNOLIA

4/4"	FAS	4,000 "
4/4"	No. 1 Com.	50,000 "
4/4"	No. 2 Com.	45,000 "

QTRD. WHITE OAK STRIPS

4/4"	Clr 2½ to 5"	13,000' "
4/4"	Com. 2 to 3"	3,500 "

PLAIN WHITE OAK

4/4"	No. 1 Com.	15,000 "
4/4"	No. 2 Com.	49,000 "

QTRD. RED OAK

4/4"	No. 1 Com.	60,000 "
4/4"	No. 2 Com.	12,000 "

PLAIN RED OAK

4/4"	FAS	48,000 "
4/4"	No. 1 Com	70,000 "
4/4"	No. 2 Com.	74,000 "
5/4"	FAS	30,000 "
5/4"	No. 1 Com.	20,000 "

PLAIN OAK

4/4"	Sound Wormy	78,000 "
4/4"	No. 3 Com.	83,000 "

POPLAR

4/4"	No. 1 Com.	200,000 "
4/4"	No. 2A & B Com.	220,000 "
6/4"	No. 1 Com. & Btr.	33,000 "

SYCAMORE

6/4"	Log Run	21,000 "

We own our stumpage and operate our own band mill in Bude, Miss., manufacturing ten million feet annually, on which we specialize in Quartered White Oak, manufactured from genuine forked leaf White Oak and Yellow Poplar of fine soft texture grown in the hills of Southern Mississippi.

Our grades are dependable and the manufacture of our stock is unsurpassed. We respectfully solicit your enquiries, which will receive our prompt and courteous attention.

L. D. Murrelle Lumber Company

General Sales Office: 1524 Exchange Bldg., Memphis, Tennessee

Band Mill: Bude, Miss.

Reese Sheriff Lumber Co.

WILLIAMSPORT, PENNSYLVANIA

Manufacturers of

Northern and Southern Hardwoods White Pine, Spruce and Hemlock

With special attention to **Oak, Chestnut, Poplar, Cherry, Walnut, Gum and Basswood.**

OUR MOTTO

REASONABLE PRICES – that you can afford to pay.
EFFICIENT SERVICE — that you have a right to expect
FAIR TREATMENT — that you can depend on getting

We would appreciate an opportunity of furnishing a portion of your lumber requirements.

AMERICAN WALNUT

"The Cabinet-wood Superlative."

Walnut Memories

and

Looking Forward

What pleasant memories a superb modern Hall Clock of American Walnut, for example, will awaken in the minds of those whose earliest associations are centered about American Walnut furniture! And the cherished pieces of American Walnut which you place in your home today will awaken the same fond memories in the breasts of those of your family into whose proud possession they shall come in later years.

In all the better furniture stores are fine examples of American Walnut furniture, "The Cabinet Wood for the Ages," which you will enjoy buying. Will you make it a point to see them?

Write for the American Walnut Brochure—edition de luxe—which is filled with information about this historic wood.

AMERICAN WALNUT MANUFACTURERS' ASSOCIATION
Room 1019, 616 South Michigan Boulevard, Chicago

THE POWERFUL EFFECTS OF THE ADVERTISING

of AMERICAN WALNUT in the best publications in America are being felt increasingly by all branches of the furniture industry. (Do you wonder the public "sits up" and walks in, and says, "AMERICAN WALNUT, please.")

THE BEST FURNITURE HOUSES IN THE COUNTRY

are "checking in" with the demand our advertising is creating. It naturally follows that only those which are well stocked will be able to "cash in" fully on this AMERICAN WALNUT revival.

30 Million Feet Hardwoods Yearly

Manufactured by

Darnell-Love Lumber Co.

Leland, Mississippi

We own and operate two large band mills with sufficient timber to supply these mills, at present capacity, fifteen to twenty years

Cutting

Oak, Ash, Gum, Elm

Cypress, Cottonwood

and various other Native Woods

Our Specialties are—

3/8", 1/2", 5/8" and 3/4" in Gum and Oak

and

8/4" Quartered Red Gum

8/4" Quartered Red Gum Sap No Defect

WE SOLICIT YOUR INQUIRIES AND ORDERS

E. SONDHEIMER CO.

MEMPHIS, TENN., U.S.A.

Band Mills at
Baton Rouge, La., Sondheimer, La., Tallulah, La.
Office & Distributing Yard, Memphis, Tenn.

Manufacturers of Southern Hardwoods **Dry Stock Ready for Shipment**

Ask us for prices. We may be able to save you some money. We specialize in genuine Tensas Basin Red Gum—best in the world.

WHITE ASH
1 car each 1", 1¼", 1½" 1s&2s
2 " 2" 1s & 2s
7 " 1" No. 1 Com. & Sel.
3 " 1¼" No. 1 Com. & Sel.
1 " 1½" No. 1 Com. & Sel.
3 " 2" No. 1 Com. & Sel.
1 " each 2½" & 3" ditto
5 " 1" No. 2 Common
2 " 2" No. 2 Common
1 " 2½, 3½, 4" No. 2 Cm.

COTTONWOOD
5 " 1" 1s&2s
1 " 1½" 1s&2s
10 " 1" No. 1 Common
5 " 1¼" No. 1 Common
5 " 1½" No. 1 Common
3 " 1" No. 2 Common
4 " 1¼" No. 2 Common
10 " 1½" No. 2 Common
2 " 1x 9 to 12" Box Bds.
2 " 1x13 to 17" Box Bds.

CYPRESS
1 " 1" Shop
2 " 1" No. 1 Common
1 " each 1x 4, 1x 8", No. 1 Com.
1 " each 1x10, 1x12", No. 1 Com.
1 " 1" Pecky

SOFT ELM
2 " 1½" Log Run
5 " 2" Log Run

PLAIN SAP GUM
10 " each 1" & 1¼" 1s&2s
15 " 4/4" No. 1 Common
2 " 5/4" No. 1 Common
15 " 4/4" No. 2 Common
10 " 5/4" No. 2 Common
5 " 4/4" No. 3 Common

BLACK GUM
1 " 1" Log Run

PECAN
3 " 6/4" Log Run
4 " 8/4" Log Run

MAGNOLIA
2 " 1" No. 2 Common
1 " 1" No. 2 Common

QRTD. RED GUM
5 " 1" 1s&2s
3 " 1¼" 1s&2s
2 " 2" 1s&2s
1 " each 2½ & 3" 1s&2s
8 " 1" No. 1 Common
3 " each 1¼ & 2" No. 1 C.

QRTD. RED GUM
(Sap No Defect)
10 " 1" 1s&2s
1 " 1½" 1s&2s
3 " 2" 1s&2s
5 " 1" No. 1 Common
3 " each 1¼ & 2 "No. 1 C.

QRTD. WHITE OAK
3 " 1" No. 1 Common
1 " 1" No. 2 Common

QRTD. RED OAK
3 " 1" 1s&2s
5 " 1" No. 1 Common
2 " 1" No. 2 Common

PLAIN WHITE OAK
1 " 3/4" 1s&2s
1 " 3/4" No. 1 Common
6 " 4/4" No. 1 Common
5 " 4/4" No. 2 Common

PLAIN RED OAK
2 " each 1" & 1¼" 1s&2s
15 " 1" No. 1 Com. & Sel.
1 " 1¼" No. 1 Com. & Sel.
10 " 1" No. 2 Common
1 " 1¼" No. 2 Common
5 " 1" Sound Wormy
8 " 1" No. 3 Common

QRTD. TUPELO
1" 1s&2s

PLAIN-SAWN TUPELO
6 " 1" 1s&2s
10 " 1" No. 1 Common
5 " 1" No. 2 Common
1 " 1" No. 3 Common
1 " 1x13 to 17" Box Bds.

WILLOW
8 " 1" 1s&2s
5 " 1¼"1s&2s
1 " each 1½ & 2" 1s&2s
15 " 1" No. 1 Common
8 " 1¼" No. 1 Common
1 " 1½" No. 1 Common
10 " 1" No. 2 Common
8 " 1¼" No. 2 Common
10 " 1½" No. 2 Common
5 " 2" No. 2 Common
1 " 1x13 to 17" Box Bds.

Lumber
Walnut, Mahogany Plain and Quartered Oak, Ash, Cherry

Veneers
Walnut and Mahogany

WE specialize in AMERICAN BLACK WALNUT and can furnish straight cars from 3/8 to 4 inches in thickness. Also can load mixed cars WALNUT and MAHOGANY LUMBER and VENEERS, PLAIN and QUARTERED RED and WHITE OAK, ASH and CHERRY.

The Kosse, Shoe and Schleyer Co.

Eastern Branch:
BALTIMORE, Md.

Main Office and Band Mill:
CINCINNATI, Ohio

American Walnut Lumber

QUALITY

SERVICE

More evidence of our untiring efforts to procure the very best raw material for our product.

All Grades and Thicknesses

Pickrel Walnut Company

St. Louis, Missouri

Tustin Hardwood Lumber Co.

MEMPHIS TENN.

KILN DRIED AND AIR DRIED SOUTHERN HARDWOODS

We operate five mills and Memphis yard, specializing in KILN DRIED Sap Gum, Elm, Maple, Ash. *Send us your inquiries.*

Will quote low prices on following to points not embargoed

4 cars 4/4 No. 1 C. & B. Qtd. White Oak.
1 " 4/4 Fas Qtd. Red Oak.
1 " 4/4 No. 1 Com. Qtd. Red Oak.
2 " 4/4 Fas Plain Red Oak.
5 cars 4/4 No. 1 Com. Plain Red Oak.
3 " 8/4 No. 1 C. & B. Qtd. Red Gum.
4 " 8/4 No. 1 C. & B. Qtd. Sap Gum.

Johnson Brothers Hardwood Co.

(OUR NAME IS EASY TO REMEMBER)

Bank of Commerce & Trust Building **MEMPHIS TENN., U.S.A**

Manufacturers and Wholesalers

SOUTHERN HARDWOODS

3,000,000 ft. dry stock on hand and 5,000,000 in process of drying—all thicknesses, ½" to 4", plain and quartered.
White and Red Oak—Red Gum—Sap Gum—Tupelo—Black Gum — Cottonwood—Salix—Willow—Pecan—Sycamore—Elm—Soft Maple—Magnolia.

We offer for quick Sale at bargain prices the following Bone Dry Stock:

1 c/l 4/4" No. 1 & 2 Common Qtd. White Oak
2 c/l 8/4" No. 1 Common Qtd. Red Gum, S.N.D.
2 c/l 10/4 Log Run Sycamore
1 c/l 10/4 Log Run Soft Maple
5 cars 4/4" FAS Cottonwood, Regular Widths
1 c/l 8/4" No. 1 C & B Red Gum
1 c/l 8/4" No. 1 C Sap Gum
1 c/l 6/4" No. 1 C & B Red Gum
2 cars 10/4" Log Run Ash

Wire us at our expense for quotations

OAK ASH COTTONWOOD MAPLE

Chapman & Dewey Lumber Company

Manufacturers of

Southern Hardwoods

Band Sawn at our Mills in the St. FRANCIS RIVER BASIN

We solicit your enquiries

—

Offices:

MARKED TREE, Ark. KANSAS CITY, Mo.

GUM ELM SYCAMORE CYPRESS

BOLAND LUMBER CO.

Murray Bldg., Grand Rapids, Mich.

Manufacturers and Wholesalers Northern and Southern Hardwoods

Northern Woods:

Ash, Basswood, Beech, Birch, Hard Maple, Quartered Maple, White Maple, Soft Maple, Soft Elm, Rock Elm,

Southern Woods:

Cherry, Chestnut, Cottonwood, Cypress, Gum, Hickory, Magnolia, Oak, Poplar, Sycamore, Walnut, Willow.

Yards at Grand Rapids, Mich., on Grand Trunk and Michigan Central R.R.

Please send us your enquiries and it will be a pleasure to quote you and describe our stocks.

OAK

Plain and Quartered

Uniform Color—Soft Texture

Poplar, Ash

and other

Hardwoods

We have 35,000,000 feet dry stock—all of our own manufacture, from our own timber grown in Eastern Kentucky

Prompt Shipments

The **Mowbray & Robinson Co.**

(INCORPORATED)

Manufacturers

Office: CINCINNATI, OHIO

MILLS

Quicksand, Ky.; Viper, Ky; West Irvine, Ky.

Canadian Representative:

M. E. CUMMINGS, 814 Richmond Ave., Buffalo, N. Y.

West Virginia Oak

Thoroughly Dry, Accurately Sawn, Soft Textured, and Uniform in Color.

Write us when needing choice stocks. All lumber produced from virgin timber of large size and excellent quality.

Twenty Million Feet Hardwood Ready for Immediate Shipment

OAK

Yellow Poplar, Ash, Hickory, Beech, Chestnut, Basswood, Walnut, Maple

THE THOMAS HALL LUMBER COMPANY

Manufacturers

CHARLESTON, WEST VIRGINIA

M. BROWN, Canadian Repres. **Address: 87 Neville Park Blvd., Balmy Beach, Toronto**

Tallahatchie Lumber Company

MEMPHIS, TENN.

Manufacturers of

Band Sawn Hardwoods

Graded so as to be especially attractive to Furniture Manufacturers.

Careful attention to every detail of service.

SEND US YOUR INQUIRIES

Chas. Gill Lumber Co.

WAUSAU, WISCONSIN

MANUFACTURERS & WHOLESALERS

SPECIALIZING IN

MAPLE
BIRCH
AND
BASSWOOD

Complete Stock Crating Material

We solicit correspondence relative to all Northern Hardwoods

Chicago Office — 501 Lumber Exchange

Band Sawn West Virginia HARDWOODS

The W. C. Barlett Lumber Co.

Charleston, W. Va.

Manufacturers

ASH to WALNUT

We produce a complete line of Band Sawn Hardwoods, serving the Body and Wheel, Furniture, Piano, Cabinet and Interior Finish Trades.

If Superior Quality, Fine Width and Length, coupled with Real Service is desired, let us have your enquiries.

Hardwood Lumber

Wire collect, or write for delivered prices on any or all of the following DRY STOCK

100,000′ 4/4 No. 1 Com. & Btr. Sap Gum
92,000′ 8/4 No. 2 Com. & Btr. Sap Gum.
69,000′ 4/4 No. 1 Com. & Btr. Plain Red Gum.
36,000′ 8/4 No. 1 Com. & Btr. Qtd. Red Gum.
12,000′ 3/4 No. 2 Com. & Btr. Plain Oak.
119,000′ 4/4 No. 1 Com. & Btr. Plain Oak.
60,000′ 4/4 No. 2 Com. Plain Oak.
68,000′ 5/4 No. 1 Com. & Btr. Plain Oak.
29,000′ 5/4 No. 2 Com. Plain Oak.
16,000′ 8/4 No. 1 Com. & Btr. Plain Oak.
160,000′ 4, 6, 8, 10 and 12/4 No. 2 Com. & Btr. Soft Elm and Soft Maple.
90,000′ 4 and 8/4 No. 2 A&B Com. Poplar.
75,000′ 8, 10 and 12/4 No. 1 Com. & Btr. Poplar.
75,000′ 4/4 No. 2 Com. & Btr. Basswood.
120,000′ 4, 8 and 10/4 No. 2 Com. & Btr. Sycamore
150,000′ 4, 5, 6 and 8/4 No. 2 Com. & Btr. Beech.
200,000′ 4, 5, 6 and 8/4 Sound Wormy Chestnut.

The Woodruff-Powell Lumber Co.

South Bend, Indiana

D. E. Hewit Lumber Co.

Huntington, W. Va.

MANUFACTURERS

West Virginia Hardwoods

(Not Better than the Best but as Good as the Best)

FAS Plain White and Red Oak
No. 1 Com. Plain White and Red Oak
Implement Oak
Sound Wormy Chestnut
No. 1 Common and Better Chestnut
Hickory Plank
Poplar and Basswood

Thompson-Katz Lumber Co.

Manufacturers of

WHITE ASH EXCLUSIVELY

In dealing with us the wood worker and furniture manufacturer may rightly expect a better service, better value and a greater selection from which to choose his requirements. We have all grades and all thicknesses to offer—beautiful stock that we know will please you. Drop us a card to-day—we'll do the rest.

MEMPHIS, TENNESSEE

J. H. Bonner & Sons

Memphis, Tenn.

Mills:

Jonquil and Ruffwood, Ark.

Manufacturers

Band Sawn Hardwood Lumber

Write or wire for prices on

Gum, Oak, Elm, Etc.

Frank Purcell Walnut Lumber Co.

Plenty of logs like the portion of our stock shown above have made possible the million and a half foot stock of well manufactured American Walnut Lumber which we now have to offer.

Prompt shipment

All grades and thicknesses

Guaranteed Inspection

12th AND BELT LINE

Kansas City - Kansas

The Wise Buyer ——

QUALITY SERVICE

The best time to buy, is—now. Prices are down. The next movement will be upward.

We are specialists in our field of activity, which means a high standard of Quality and service.

Manufacturers of

OAK - POPLAR - GUM

Memphis Band Mill Co.

"Quarter-Sawn White Oak Headquarters"

Memphis, Tenn. - U. S. A.

Efficiency Marks Every Step of Our Service to You

Exact photograph of alley in our yard

White and Red Oak

Plain & Quarter Sawed Red Gum

Our Specialty Quarter Sawed Red Gum in Plain and Figured Wood

From the cutting to the delivery to your hands, our entire stock receives the most careful attention. All the excellence of quality and the beauty of the wood is kept just as it is when cut. When next you are in need of Oak, Ash, Elm, and Cypress of first class quality and in perfect condition write us. We can ship promptly.

BARR-HOLADAY LUMBER CO.

BAND MILL AT LOUISE, MISS. GREENFIELD, OHIO

Burns & Knapp Lumber Co.

Manufacturers of

Southern Hardwoods

Plain White and Red Oak, Dimension Oak, Hickory, Ash, Chestnut, Poplar, Basswood, Walnut, Maple, Beech, Butternut.

CONNEAUTVILLE,——————PA.

We list below, items of our own manufacture, band sawn, that we are in a position to ship promptly.

1/2", 5/8, 3/4, 4/4, 5/4, 6/4 & 8/4 Quartered White Oak

3/4, 4/4, 5/4 & 6/4 Qtd. Red Oak

5/8, 3/4, 4/4, 5/4, 6/4 & 8/4 Plain Oak

4/4, 5/4, 6/4, & 8/4 Sound Wormy Oak

5/8, 4/4, 5/4 & 6/4 Plain Sap Gum

4, 5, 6, 8, 10 & 12/4 Qtd. Sap Gum

4, 5 & 6/4 Plain Red Gum.

4, 5, 6, 8, 10 & 12/4 Qtd. Red Gum

4, 5, 6 & 8/4 Tupelo Gum.

5/8, 4, 5, 10 & 12/4 Ash.

5/8, 4, 5, 6, 8, 10 & 12/4 Elm.

5/8, 10 & 12/4 Maple.

4, 5 & 6/4 Cottonwood.

MAY BROTHERS

Office and Band Mills: MEMPHIS, TENNESSEE

High Grade White Hickory

Ready for immediate shipment "Buttcut" Brand Second Growth White Hickory, absolutely sound and clear of defects.

20,000 feet 1-1/2" x 2" x 36"
20,000 " 1-5/8" x 2-1/8" x 36"
20,000 " 2" x 2" x 40"
10,000 " 1" x 2" x 36" & 40"
10,000 " 1" x 1-3/4" x 36" & 40"
10,000 " 1" x 1-5/8" x 36"
10,000 " 1" x 1-1/2" x 36"

60,000 feet assorted
1-1/2" x 2" x 12" & 24"
1-5/8" x 2-1/8" x 12" & 24"
1-1/2" x 2-1/4" x 12" & 24"
1-5/8" x 2-1/4" x 12" & "24
1-3/4" x 2-1/4" x 12" & 24"
1-3/4" x 2-3/8" x 12" & 24"
1-3/4" x 2-3/4" x 12" & 24"
2" x 2-3/8" x 12" & 24"
2" x 2-1/2" x 12" & 24"

20,000 feet assorted
1-1/8" x 1-1/4" x 6' to 7' 6"
1-1/4" x 1-1/4" x 6' to 7' 6"
1-1/4" x 1-3/8" x 6' to 7' 6"
1-3/8" x 1-3/8" x 6' to 7' 6"

25,000 feet assorted Squares
2", 2-1/8", 2-1/4", 2-3/8", 2-1/2", 2-5/8"
all 6'0" to 8'0" long

BROWN BROTHERS COMPANY

11 Broadway, New York City. Cable Address: "Lignis" New York

The BRAND of QUALITY

Bigelow HARDWOOD PRODUCTS

The SYMBOL of SERVICE

A Complete Stock of Assorted Grades and Thicknesses

NORTHERN HARDWOODS

ASH, BEECH, BIRCH, BASSWOOD
SOFT ELM, ROCK ELM, HARD MAPLE

THE BIGELOW-COOPER CO.

BAY CITY - - MICHIGAN

St. Francis Basin Hardwoods

Kraetzer Cured and Air Dried

Tennessee Aromatic Red Cedar

Carloads and less or mixed with Hardwoods

"What Others Say"

"Your letter of February 15th received and we want to say that this was a very nice lot of lumber. It was good widths and lengths and well manufactured, dry stock and the grading was very liberal. We are sorry we cannot use more of this lumber at the present time. *We received several cars from other manufacturers at a cheaper price but the lumber was not nearly as satisfactory.* When we are in need of more stock we will take the matter up with you."

(Note—The above was sent us February 24, 1921 unsolicited. Name given on application).

GEO. C. BROWN & COMPANY

Home Office - MEMPHIS, TENN.

BAND MILLS, PROCTOR, ARK. CROOKED BAYOU, ARK.

The Arrow Lumber Co.

L.C.Co. REG U S PAT OFF

Manufacturers and Wholesalers of

West Virginia Hardwoods and White Pine

Oak Timbers Our Specialy

PARKERSBURG, W. VA.

Mills: Raleigh, W. Va. Natural Well, Va.

McLEAN MAHOGANY & CEDAR CO., INC.

American Hardwoods

WE SOLICIT YOUR ENQUIRIES

742 Ellicott Square, Buffalo, N.Y.

Yellow Poplar Lumber Co.

Manufacturers of Band Sawed

Poplar Plain Oak
Quartered Oak
Chestnut Basswood

Capacity 50,000,000 per annum

SPECIALTY: Monogram Brand Oak Flooring

CANADIAN ENQUIRIES SOLICITED

COAL GROVE, OHIO, U. S. A.

The Bacon Lumber Co.

HARDWOODS:

OHIO and INDIANA
KENTUCKY and WEST VIRGINIA
NORTHERN BIRCH and MAPLE
SOUTHERN GUM, COTTONWOOD

306 Ulmer Bldg., Cleveland, Ohio

FIBRO PRODUCTS
REEDS ∴ RATTANS
TURPENTINE
RESIN ∴ WASTE
∴ LINTERS ∴

∴ *PROMPT OR FUTURE SHIPMENTS* ∴

E. T. CARTER & CO., LIMITED
84 FRONT ST., E. —— TORONTO

For Discriminating Buyers

Dry stock ready for prompt shipment

FIGURED RED GUM

3	cars	4/4″	No. 1 Com. & Btr.
2	"	5/4″	No. 1 Common & Better
1	"	8/4″	No. 1 Common & Better

SAP GUM

2	"	4/4″	FAS
2	"	4/4″	FAS, 13″ & up
3	"	4/4″	Box Boards, 13-17″
1	"	5/4″	FAS
1	"	8/4″	Com. & Btr.
3	"	4/4″	No. 1 Common
4	"	5/4″	No. 1 Common
8	"	4/4″	No. 2 Common
10	"	5/4″	No. 2 Common
1	"	6/4″	No. 2 Common
1	"	8/4″	No. 2 Common

PLAIN RED GUM

1	"	4/4″	FAS
3	"	5/4″	FAS
6	"	4/4″	No. 1 Com. & Btr.
3	"	4/4″	No. 1 Common
5	"	5/4″	No. 1 Common
1	"	8/4″	No. 1 Common
3	"	4/4″	No. 2 Common

QUARTERED RED GUM

3	"	4/4″	Com. & Btr.
2	"	5/4″	FAS
5	"	4/4″	Com. & Btr.
4	"	6/4″	Com & Btr.
3	"	8/4″	Com. & Btr.
3	"	5/4″	No. 1 Common

SOFT ELM

1	"	4/4″	Log Run
1	"	5/4″	Log Run
2	"	6/4″	Log Run
1	"	8/4″	Log Run
2	"	10/4″	Log Run
2	"	12/4″	Log Run

QUARTERED RED GUM S.N.D.

1	"	5/4″	FAS
1	"	3/4″	Com. & Btr.
3	"	4/4″	Com. & Btr.
10	"	6/4″	Com. & Btr.
7	"	8/4″	Com. & Btr.
2	"	5/4″	No. 1 Common
2	"	10/4″	No. 1 Common & Better
2	"	12/4″	No. 1 Common & Better

WILLOW

5	"	4/4″	Log Run

CYPRESS

1	"	4/4″	No. 1 Shop
2	"	4/4″	No. 1 Common
1	"	5/4″	FAS
1	"	5/4″	Select
1	"	5/4″	No. 1 Shop
1	"	8/4″	FAS
1	"	8/4″	Select
1	"	8/4″	No. 1 Shop
1	"	8/4″	No. 1 Common

PLAIN RED OAK

1	"	4/4″	FAS
6	"	4/4″	No. 1 Common
7	"	4/4″	No. 2 & No. 3 Common

QUARTERED RED OAK

1	"	4/4″	FAS
7	"	4/4″	No. 1 Common
6	"	4/4″	No. 2 Common

PLAIN WHITE OAK

1	"	4/4″	FAS
4	"	4/4″	No. 1 Common
2	"	4/4″	No. 2 Common

QUARTERED WHITE OAK

1	"	4/4″	FAS
5	"	4/4″	No. 1 Common
7	"	4/4″	No. 2 Common

WIRE FOR QUOTATIONS AT OUR EXPENSE

The

Frank A. Conkling Company

SOUTHERN HARDWOODS

BAND MILLS:
PERCY, Miss., ISSAQUENA, Miss.

Memphis, Tenn.

Indiana

Quartered Red and White

OAK

1,000,000 feet of dry stock carried at all times

ALSO PLAIN OAK AND ASH

We manufacture all stock carried

Evansville Band Mill Co.

FRANK M. CUTSINGER, Pres.
GEO. H. FOOTE, Vice-Pres. & Treas.
JOSEPH WALTMAN, Secretary

Mills at EVANSVILLE, Indiana

Upham & Walsh Inc.

Throop St. South of 22nd St.

Chicago

Northern and Southern Hardwoods

We make a Specialty of

Oak, Gum, Elm, Maple Birch and Basswood.

We solicit your inquiries regarding lumber of any kind

American Hardwood Lumber Co.

St. Louis, Mo.

Large stock of—

Dry Ash, Quartered Oak Plain Oak and Gum

Shipments from — NASHVILLE, Tenn., NEW ORLEANS, La., and BENTON, Ark.

The Hyde Lumber Co.

Band Mills: LAKE PROVIDENCE LA.
Southern Office: MEMPHIS, TENN.
Bank of Commerce Bldg.
Northern Office: SOUTH BEND, IND.

MANUFACTURERS

Plain Red Gum
Quartered Red Gum
Plain Sap Gum
Quartered Sap Gum
Cottonwood, Cypress
Tupelo, Ash, Elm, Oak

CHARLES O. MAUS
Canadian Representative

WARREN ROSS LUMBER CO.

JAMESTOWN, N. Y.

30,000′	4/4″	1s&2s Tanguile Mahogany	12,000′	8/4″	No. 1 Com. Walnut
35,000′	6/4″	to 16/4 1s&2s Tanguile Mahogany	7,000′	8/4″	No. 2 Com. Walnut
20,000′	4/4″	1s&2s Cherry	15,000′	4/4″	1s&2s pl Red Oak
12,000′	4/4″	No. 1 Com. Cherry	4,000′	5/4″	1s&2s Pl. Red Oak
5,000′	6/4″	1s&2s Cherry	4,000′	6/4″	1s&2s Pl. Red Oak
5,000′	8/4″	1s&2s Cherry	20,000′	8/4″	1s&2s Pl. Red Oak
5,000′	5/4″	No. 1 Com. Cherry	20,000′	4/4″	No. 1 C P Red Oak
2,000′	8/4″	No. 1 Com. Cherry	4,000′	5/4″	No. 1 C P Red Oak
110,000′	1″ to 2″	No. 2 Com. & Btr. Beech	4,000′	6/4″	No. 1 C P Red Oak
1,500′	5/4″	Selects Walnut	10,000′	8/4″	No. 1 C P Red Oak
15,000′	8/4″	1s&2s Walnut	15,000′	4″4″	1s&2s Poplar SND
			3,000′	5/4″	1s&2s Poplar SND
			3,000′	8/4″	1s&2s Poplar SND

Above stock in our Jamestown yard where we have a large stock of all kinds of dry Hardwoods. Also Northern and Southern Hardwoods and Mahogany direct from mill in unlimited quantities.

"Hartzell's Choice Walnut"

The way Walnut comes to us

COMING AND GOING

One constant stream of American Black Walnut from "Stump to Consumer" flowing through a steady, reliable and satisfactory channel.

"Geo. W. Hartzell"

Logs in the rough coming in Veneers and Lumber of the highest quality going out daily year in and year out covering a period of 35 years.

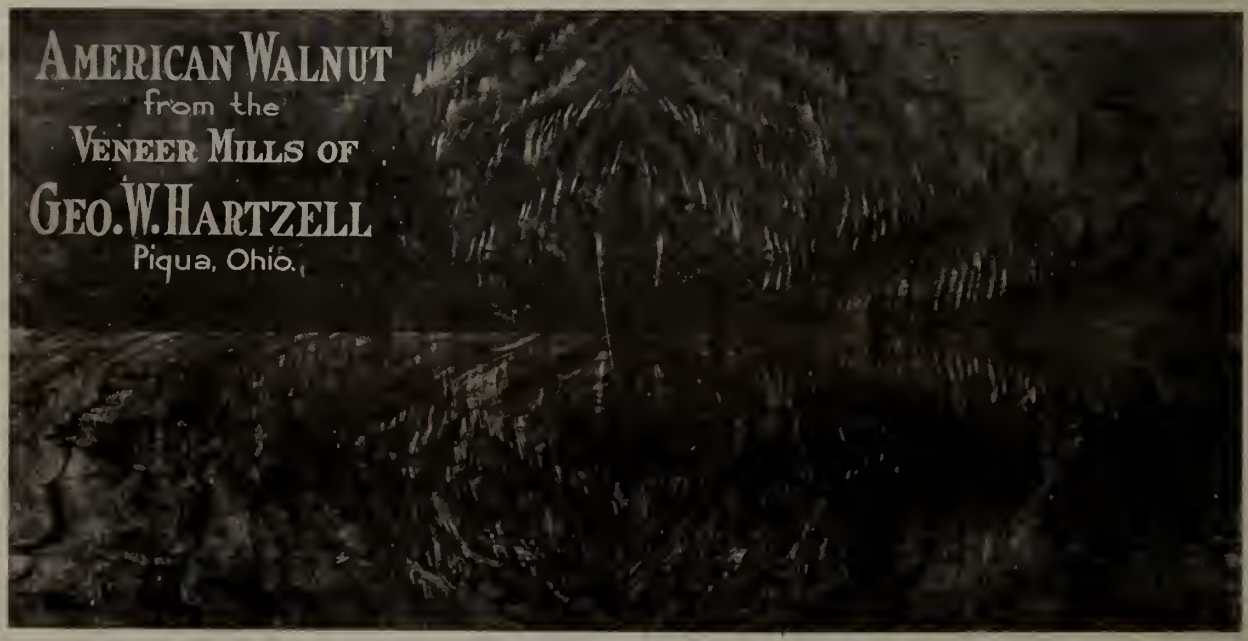
We rightfully claim your patronage because of "SERVICE and QUALITY," if there is any question in your mind about it

"Try Us and We Will Ship You the Convincer"

No Order too large, no Order too small to receive the close and careful attention it is our custom to give. That is a great part of our business, serving our customers.

"WRITE FOR SAMPLES AND QUOTATIONS"

Geo. W. Hartzell - Piqua, Ohio



The way it goes to our Customers

MAHOGANY LUMBER *and* VENEER
AMERICAN WALNUT VENEER

Loading Mahogany Logs in the Tropics

OUR LARGE AND SELECTED STOCK AT YOUR INSTANT DISPOSAL WHEN NEEDED

Lewis Thompson & Co., Inc. - Colonial Trust Building, Philadelphia, Penn.

Warerooms: Astoria L.I., High Point, N.C. Yards: Astoria, L.I., New Orleans, La.

Established 1843

E. R. Spotswood & Son

INCORPORATED

MANUFACTURERS OF

Kentucky Hardwood Lumber

We specialize in soft texture Kentucky Oak—Plain and Quarter Sawed, also in Ash, Basswood, Chestnut, Poplar, Beech.

Let us quote you on your requirements—our prices are right and we can make prompt shipments direct from our mills.

LEXINGTON - - KENTUCKY

— *A name worth remembering* —

Thomas E. Powe Lumber Co.

St. Louis, Mo.

Manufacturers and Wholesalers of

SOUTHERN HARDWOODS

Specializing in

Ash-Oak-Gum-Poplar

Mills: PRESCOTT, ARK.—DOTHAN, ALA.

ST. LOUIS YARD

Mixed Carload Shipments — Carry stocks of the following:

Hickory	Magnolia	Elm
Maple	Willow	Sycamore
Tupelo	Red Cedar	Beech
Cypress	Plain Oak	Quartered Oak
Sap Gum	Red Gum	Mahogany
Poplar	Ash	Black Gum
Yellow Pine		

WAYNE LUMBER CO.

Manufacturers and Wholesalers

110 West 40th St. New York

Canadian Hardwoods

BROWN ASH			BIRCH	
10,000′ 1¼	No. 1 Com. & B.	15 cars 1″		No. 1 Common
10,000′ 1¼	No. 2 Common	15 “	1	No. 2 Common
		10 “	1¼	No. 1 Common
BASSWOOD		7 “	1¼	No. 2 Common
		10 “	2	No. 1 Com&1s&2s
200,000′ 1¼	Log Run	7 “	2	No. 2 Common
1 car 1½	Log Run	3 “	2½	No. 1 Com&1s&2s
1 car 2	Log Run	3 “	2½	No. 2 Common
		4 “	3	No. 1 Com&1s&2s
SOFT ELM		HARD MAPLE		
50,000′ 1″	Log Run	40,000′ 1¼″		No. 1 Com&1s&2s
40,000′ 2	Log Run	10,000 1¼		No. 2 Common

MAPLE AND BIRCH OUR SPECIALTY

BOXING & CRATING

6 cars 1″ Soft Elm & Ash

10 “ 1″ Birch

All Lumber Shipped by Our Own Inspectors

A name that should be on your inquiry list for Hardwood Lumber

American Column & Lumber Co.

Brunson Building, COLUMBUS, OHIO

—Manufacturers of—

West Virginia

Soft Yellow Poplar
Plain White Oak
Plain Red Oak
Quartered White Oak
White Oak Timbers and Plank

Chestnut	Butternut
Basswood	Ash
Maple	Cherry
Hickory	Walnut
Beech	Sycamore
Buckeye	Black Gum
Birch	Hemlock

Oak and Hardwood Dimension Stock

Steele & Hibbard Lumber Co.

ST. LOUIS, MO.

52 Years in Business

We carry a large stock of dry

Hardwood Lumber

25 Different Kinds
Quick Shipment
Write or wire for Prices

We specialize Oak cut from Mild Texture Missouri Timber with thin sap both plain and quarter sawed.

We ship also from Sawmills direct; Red as well as Sap Gum and Poplar, both plain and quarter sawed Sound Wormy Chestnut, Cypress and Ash.

F. Huntington Smith

Canadian Representative.

SPECIALS!

For Immediate Shipment

QUARTERED RED GUM

8 cars 2½" Common and Better.
5 " 3" Common and Better.
8 " 1¼" Common
8 " 2" Common.

PLAIN SAWED RED GUM

6 cars 2½" Common & Better.
3 " 3" Common and Better.
5 " 2" Common and Better.

OAK

10 cars 1" No. 1 Com. and Btr., White, Pln.
10 " 1" No. 1 Com. and Btr., Red, Qtd.
2 " 1½" 1sts & 2ds Qtd. White.

Thomas & Proetz Lumber Company

No. 3400 Hall St. St. Louis, Mo.

Peytona Lumber Co. Inc.

HUNTINGTON, W. VA.

BAND MILLS OMAR, CHRISTIAN LOGAN COUNTY, W. VA.

Band Sawed West Virginia Hardwoods

WHITE OAK	BASSWOOD
RED OAK	MAPLE
CHESTNUT	BEECH
POPLAR	HICKORY

Our own facilities for Surfacing, Resawing and Kiln Drying

William S. Whiting Company

JOHNSON CITY, TENNESSEE

1 Band Mill *5 Circular Mills*

Hardwood Lumber

Oak	Basswood
Maple	Buckeye
Chestnut	Poplar
Ash	Birch

Rotary-Cut Soft Yellow Poplar Veneers
Quarter-Sawn White Oak Flitches
Sliced and Sawn Quartered White Oak Veneers
Oak and Maple Flooring
Dowel Pins and Dowel Rods
Glued-Up Chestnut Cores and Dimension

5-16" Oak Parquetry Flooring Strips and Squares carried in stock at our warehouses:
138 44th St., Brooklyn, N.Y., and at Elizabethton, Tenn.

Arkla Lumber & Mfg. Company

Main Office: - St. Louis, Mo.

Manufacturers and Wholesalers

Ash—Plain and Qtd. White and Red Oak Poplar, Cypress, Gum

In addition to stocks at Mill, we carry a well assorted dry stock of all items on our St. Louis yard available for immediate shipment. Write or wire us (our expense) for quotations.

F. HUNTINGTON SMITH
Canadian Representative

L. D. LEACH & COMPANY

FISHER BUILDING, - CHICAGO, Ill.

Manufacturers Hardwood Lumber

6 Cars 4/4 No. 1 Common Red and White Oak
5 Cars 4/4 No. 2 Common Red and White Oak
4 Cars each 8/4 in. No. 1 and No. 2 Com. R. and W. Oak
2 Cars each 10/4 in. and 12/4 in No. 1 and No. 2 Common Red and White Oak

Oak Furniture — Vehicle and Car Stock Dimensions Sawed to Order

4/4 in. Gum—All Grades
4/4 in. Cypress—All Grades
4/4 in., 8/4 in. and 10/4 in. Log Run Soft Elm

HARDWOOD LUMBER

THIRTEEN BAND MILLS
SIX PLANING MILLS
ELEVEN FLOORING UNITS
NINE DIMENSION MILLS

ANNUAL CAPACITY:
130,000,000 feet.

Who is blamable for the ignorance of the public generally in respect to manufacturers' prices of hardwood lumber?

Largely the newspapers, but essentially the manufacturers themselves.

Many newspapers are edited and conducted along the lines of least resistance. It is easier to write an editorial out of the abysmal fund of ignorance, with which unhappily too many editors seem generously supplied, than to write concerning facts which it may require some energy, industry and application to acquire.

These observations are suggested by an editorial a few days ago, in a paper of considerable standing and wide circulation, which commented upon the present "extortionate prices" of lumber being exacted from the public by the producers. It spoke of the effect of such prices in diminishing the building spirit, etc.

Such conduct of newspapers does more than can be imagined to produce the very effect they deplore,—and such papers do these things—let us assume in charity—through ignorance.

The editor of the paper referred to, did not know that hardwood manufacturers had been selling their lumber for months at less than cost.

Manufacturers, wholesalers, retailers,—everybody interested in lumber, should in their respective communities see to it that the truth is known—such false impressions hurt the industry in its every department.

Business is improving; with everyone taking action to make the truth known, it will improve more rapidly.

W. M. Ritter Lumber Co., Columbus, Ohio

Canadian Representative: John Hall, 160 Huron St., Post Office Box 32, Toronto

PERIOD CARVINGS

for

FURNITURE

Quality the Best

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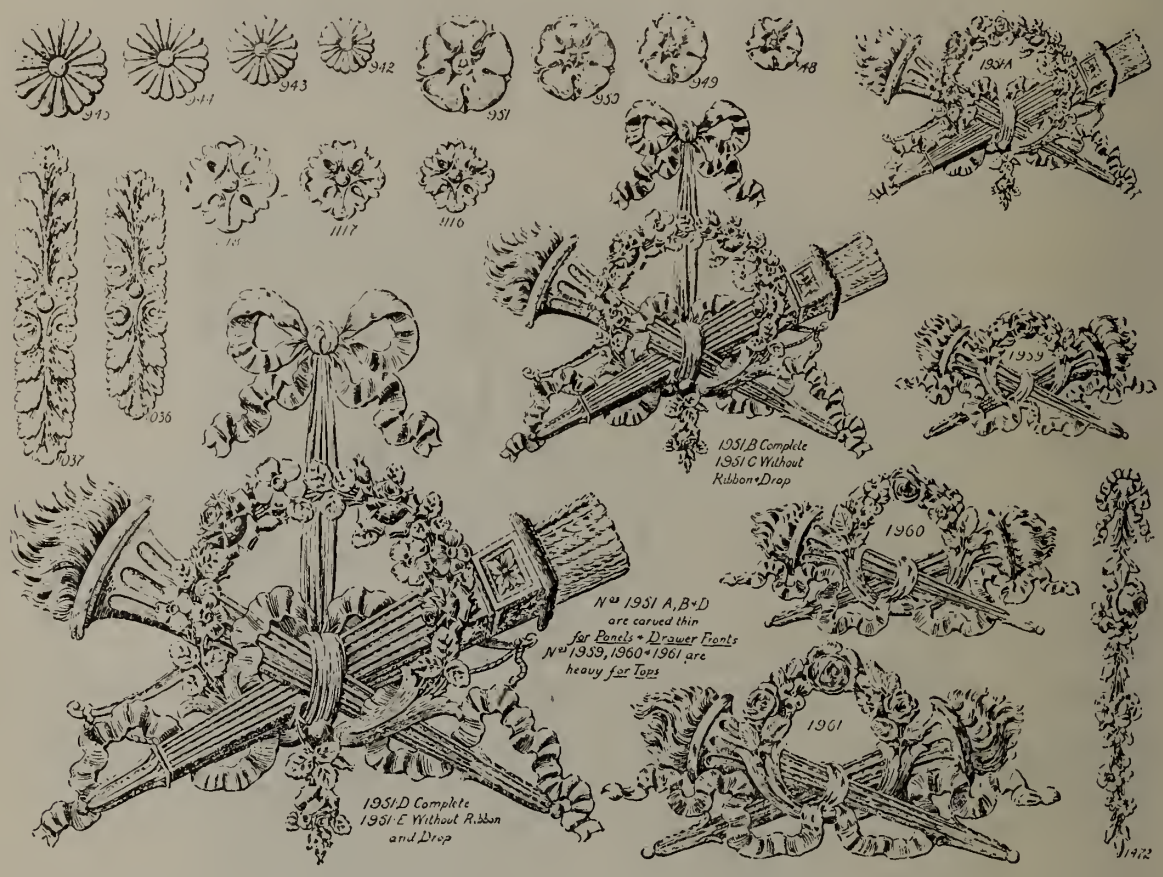

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SUBSCRIPTION RATES

The postal rates on periodicals having been trebled on January 1st, 1921, the subscription price of the "Canadian Woodworker" has been increased to $2.00 a year; United States and Foreign, $2.50. Current subscriptions will be continued at the former rate until expiration of the subscription year.

Is Greater Production the Solution?

The attention of the reader is directed to an interesting article elsewhere in this issue in which Wm. A. Babbitt, the general secretary of the National Association of Wood Turners, analyzes factory costs and points out the startling fact that a 30 per cent. increase in production results in reducing the selling price of an article to a greater extent than a reduction of 25 per cent. in the cost of both labor and raw material. The point is a vital one—one that is not fully realized—and should have the careful consideration of both employer and employed.

The attitude of certain woodworkers seems to be that, now that lumber and other raw materials have declined, all that is required to bring costs down to a normal basis is to make a cut in wages. When that has been done, manufacturing costs have been reduced to the lowest point possible under present conditions, or, in other words, all that is possible has been done to establish a new level of values. This attitude takes for granted that there is no room for improvement either in the organization and equipment of the plant or in the productiveness of the employees.

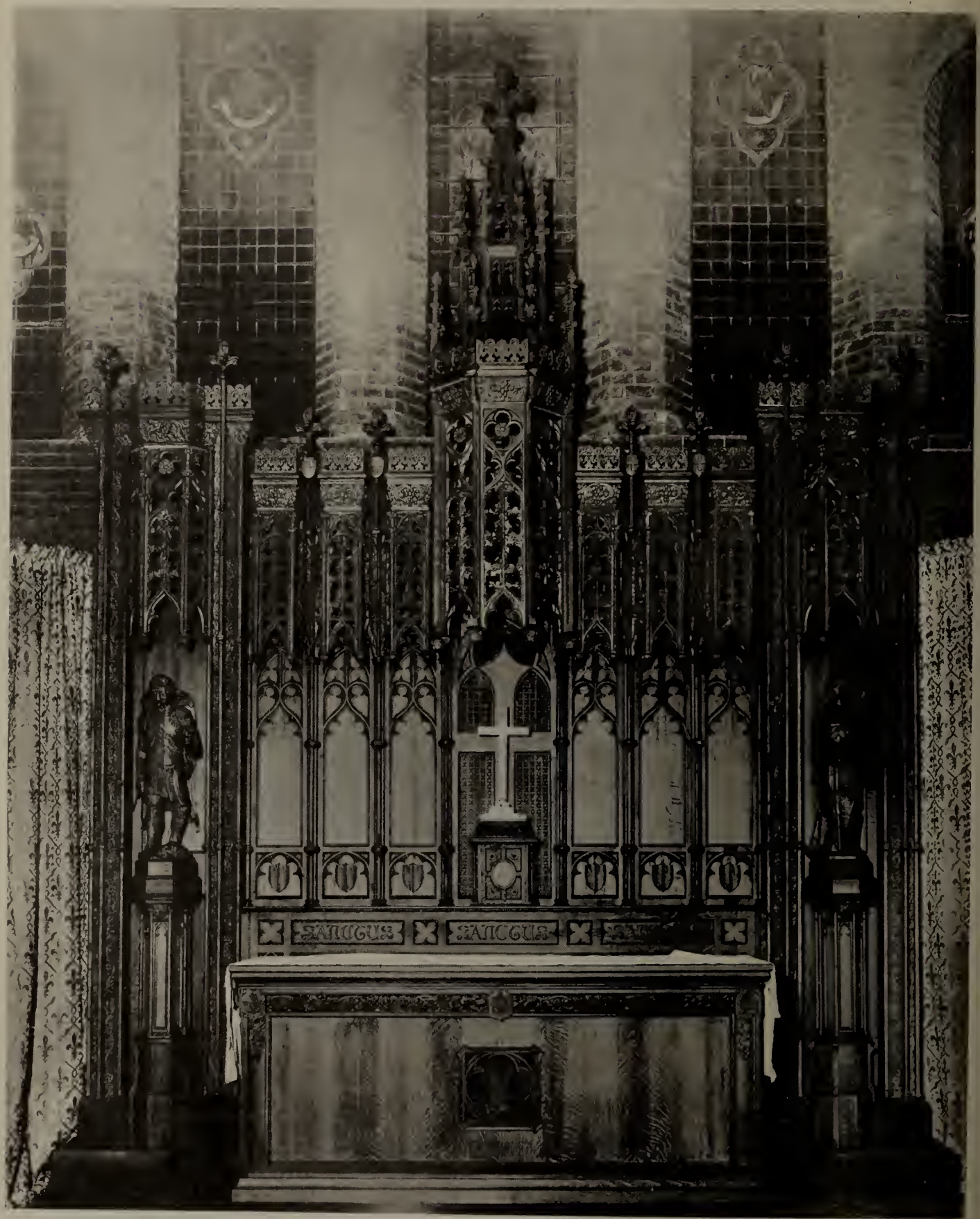
Efficiency, economy, productiveness and co-operation are words that have been worked overtime in recent years, yet the period upon which we are just entering is one in which these qualities or properties are required, in both the individual and the organization as a whole, as never before. This is true for a number of reasons, among which might be cited the fact that because of the smaller volume of business offering, there will be keener competition for all orders which may be available and to the fact that a low level of values must be established before the confidence of the public is restored and buying becomes general. It is, therefore, the duty, as well as a wise protective measure, of every manufacturer to give the closest possible attention to the manufacturing end of his business.

It may be suggested that an up-to-date, well-equipped, systematically organized plant is of little benefit unless the workmen put their shoulders to the wheel and do their best. There may be a lot of truth in this suggestion, but first give your employees the tools and organization and then go after them for results. Regardless of how practical and how skilled the workmen may be, they are handicapped both mentally and physically unless the environment in which they work is modern in all respects. It stands to reason that a mechanic will not have the same incentive to do his best or will not derive the same amount of pleasure from his work if he is forced to labor under antiquated methods and with out-of-date equipment, as if modern machines were provided and he is forced to extend himself to keep up with the development of the organization. Provision must be made to bring out the best that is in the man before the best should be expected.

After being satisfied that the plant and system is as it should be, the next step is to win the confidence and co-operation of the employees. There is no doubt that their efficiency has been impaired and that they do not look on their work as seriously as they were wont to do in former years. Explain the seriousness of the present situation to them. Show how vital it is, not only to the business but to their means of earning a living, that new low values be reached and trade stimulated. Outline by means of charts and figures, the far-reaching effect of overhead and production on manufacturing costs; show how an increase in productiveness is far better than a reduction in wages, even carrying it to the extent where if the output can be raised to a certain point an increase in wages is possible. Let this be the goal toward which they strive.

Probably one of the best means of securing the confidence of the men is the holding of regular, informal discussions between the management and the foremen and department heads. This idea is being gradually adopted by the woodworking fraternity in Canada. The manager of one large woodworking plant in describing some of the meetings he has held with his employees, stated that it was a surprise to him how readily those present grasped the essentials of the situation and the wealth and practicability of the suggestions made and the spirit shown when once their co-operation was secured.

The goal — increased production — is clearly defined. Let both employer and employee strive with this single purpose in view and both will profit in proportion to the progress made toward this objective.



Carved oak reredos and altar for the Church of St. John The Evangelist, Hamilton, Ont., made and installed by the Valley City Seating Co., Limited, Dundas, Ont.

Canadian Craftmanship Ranks High

Altar and Reredos in Hamilton Church Work of Art—Detail of Carvings Exceptionally Fine—Reflects Credit on Manufacturer and Artisans

A very noteworthy example of the wood carver's art in the form of an altar and reredos, has recently been installed in the Church of St. John the Evangelist, Hamilton, Ontario, in memory of the two sons of the Reverend Canon Daw, the late rector of the parish, and of their cousin, A. G. Fraser, who made the supreme sacrifice while serving the Empire in the Great War.

Centre Panel of Altar.

The altar is chaste and simple in design, the wide expanse of the front being relieved only by an exquisitely carved panel in the centre and the natural beauty of the oak grain. This treament emphasizes the richness of the reredos with its wealth of decorative detail. The cornice is enriched by running foliage with the inscription "To the Glory of God" interwoven. At each corner and in the centre of the cornice is a shield with the crests of the 21st, the 58th and the Worcestershire Regiments carved in relief, representing the units in which those whose memory is being perpetuated saw service.

The detail of the ornament of the central panel is particularly fine. An elegantly carved shield with the I.H.S. emblem cut in relief is enclosed in a quarterfoil which in turn is contained in a circle within a square. Within the quarterfoil and surrounding the shield are carved the Rose, Thistle, Shamrock and Maple Leak in natural foliage. In the end panel of the altar is engraved the names of the fallen heroes, cut deeply in the solid oak. The altar is 9 ft. in length, 2 ft. 6 in. in depth and 3 ft. 3 in. high. It stands clear of the reredos, a space of two feet being allowed for passage between. The design of the reredos in general follows the fifteenth century perpendicular Gothic, the principal feature being a central canopy with spire, the finial of which rises 20 feet from the floor of the Sanctuary, and two well-proportioned side towers which form niches for figures of the militant saints, St. George and St. Michael.

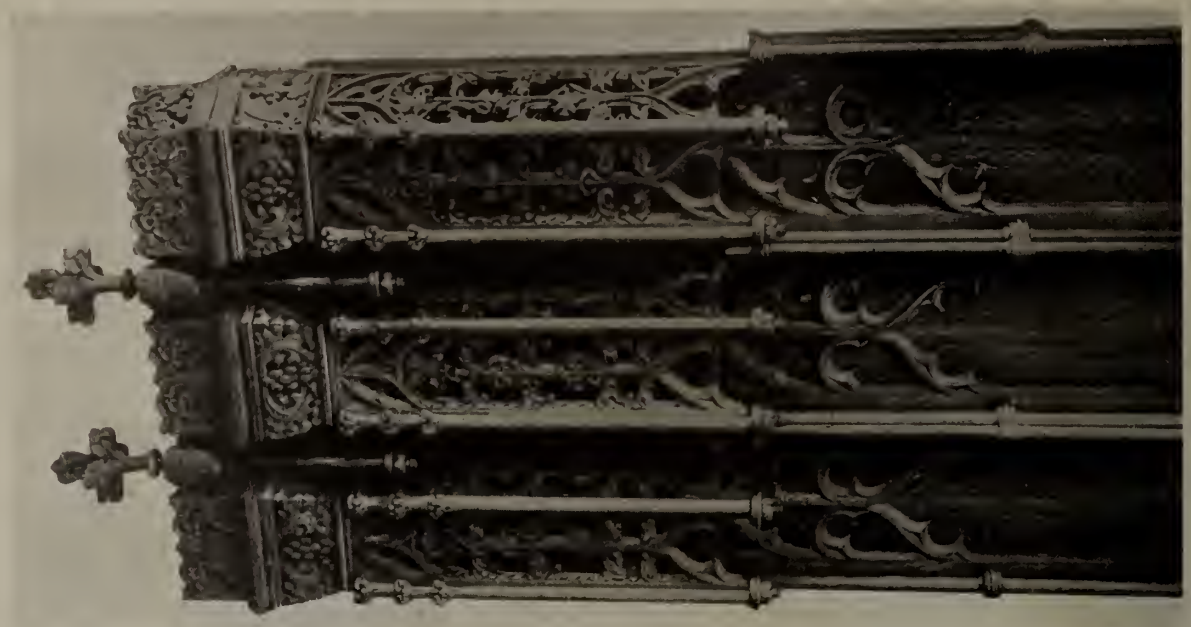
These towers are connected to the central canopy by a series of smaller canopies, three at each side. An enriched cornice and carved and perforated cresting surmounts all the towers and canopies with small carved finials placed at intervals. The background is enriched by tracery panels, the lower portion of which forms a series of arches each enclosing a shield. Upon the gradine or retable are the words "Sanctus, Sanctus, Sanctus," each letter of which is finely modelled and carved in relief. A small but exquisite tabernacle has been introduced in front of the centre panel, which supports a cross. The Tabernacle was removed from the old altar and incorporated some time ago.

The centre canopy is 10 ft. 6 in. high, and is octagon in plan. The lower portion is composed of open work tracery panels with free natural ornament interwoven. No two of these panels are alike, yet each is in harmony with the rest. The posts are terminated with winged cherub heads. The cornice is enriched by free ornament of conventional design and further embellished by a carved and perforated cresting; a slender crocketed pinnacle rises from each post. Above the cornice is a tier of open tracery panels of strictly conventional character with a second series of crocketed pinnacles at each angle, and these in turn surmounted by a tapered tracery spire terminated with a large carved finial.

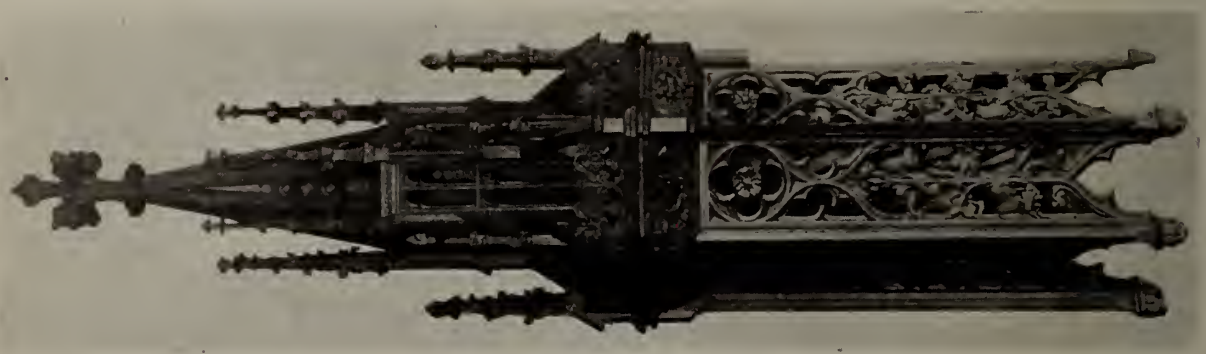
The side towers, 13 ft. 6 in. in height, are a particularly pleasing feature of the design. They form each a niche for the figures which stand on pedestals. The posts of these towers are triangular in plan, the apex being to the front, and the angles covered by a slender turned post. The foremost one proceeds in front of the cornice, and terminates in a carved pinnacle, producing an unusual and pleasing effect. The sides of the triangular posts are decorated by a perforated grape vine ornament, freely carved in natural foliage. The illustration of the upper canopy of these towers show the detail of this ornamentation very clearly, the deep shadows of the recess throwing the lines of the carved tracery of the panels into prominence and producing a light and lace-like effect. The illustration also shows the rich model-

Attractive in its simplicity—The altar.

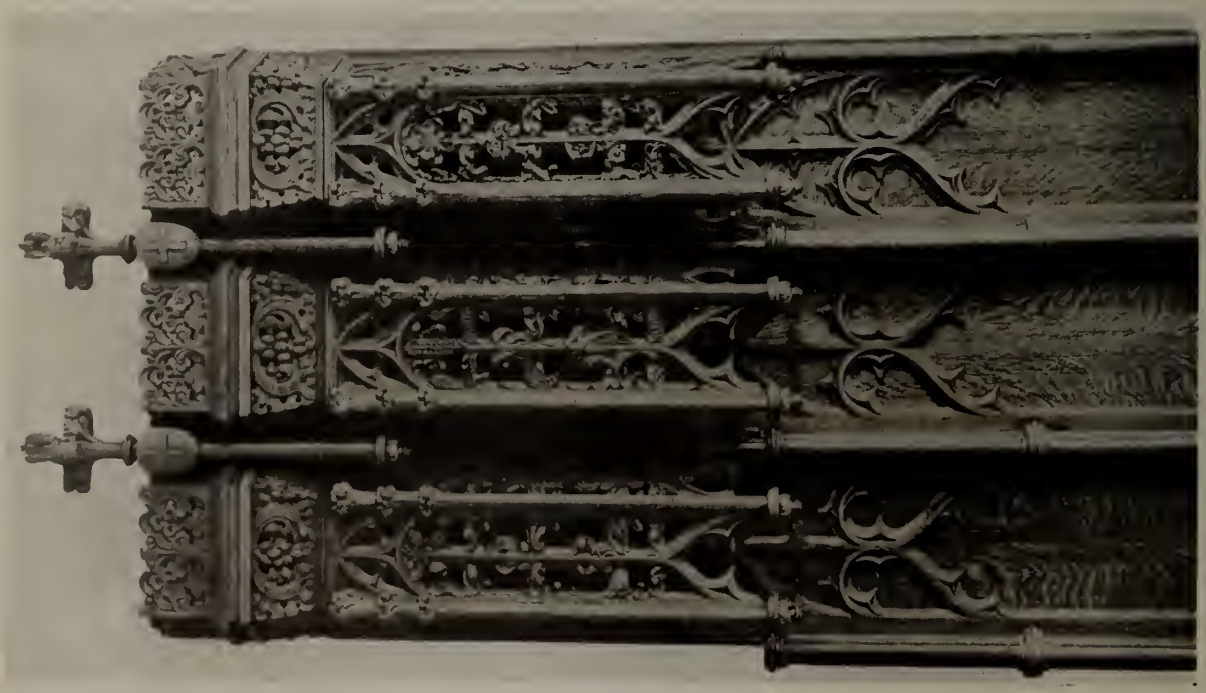
Views Showing Details of Canopy



Intermediate canopy (right).



Centre canopy.



Intermediate canopy (left).

Figure of St. Michael.

Upper canopy of side towers showing fineness of detail.

Figure of St. George.

ling of the carved cornice and cresting very distinctly.

The intermediate canopies have a special feature in their open work carved panels, eighteen in number, which are all cut to a different motif, the Rose, Thistle, Shamrock, Maple Leaf, Wheat, Vine and Pomegranate being exemplified among others. The skill and individuality of the craftsman are especially noticeable in these panels, making them a dominant feature of the whole work.

The figures stand 36 inches high and are carved of solid oak. The figure of St. George closely follows the "Donatilli" St. George. The figure of St. Michael was still in the hands of the carver when the photo was taken.

The whole is generally conceded to be an exceptionally fine piece of wood craftsmanship, as well as an excellent example of "Made in Canada" art. The work in its entirety was produced in the workshops of the Valley City Seating Company, Dundas, Ontario, and was executed by their regular staff of designers and craftesmen under the supervision of Mr. W. P. Witton of the firm of Witton & Walsh, architects, Hamilton.

It is, to say the least, a superb and inspiring memorial one which is admirably executed, and a lasting credit to those who conceived and executed the design.

The optimist is the man who sees in every obstacle an opportunity; the pessimist is the man who sees in opportunity an obstacle.

Turning Curtain Rings

Curtain rings are turned up on a single-head lathe of short bed length, a friction clutch being situated on the head stock spindle and operated by means of a foot-lever or treadle. In conjunction therewith is also a brake, which also is applied through a foot-lever, its purpose being to stop the lathe spindle smartly, and to avoid loss of time in putting in and taking out the work.

The wood for the rings is sawn into squares a little larger and thicker than the finished article, and is held by a special screwed driving centre, the spindle being stopped by the treadle and brake. As soon as the wood is gripped, the treadle is released, and the spindle and wood instantly revolve, the time taken to stop the spindle being 1½ seconds, while from standing to full speed of the lathe occupies only about 4 seconds.

The front tool for forming, as also the cutting-out tool, is arranged on a specially-designed slide rest attachment, which is adjustable on the bed of the lathe. The operation consists in swinging round the front tool on its axis, which movement forms the outside of the ring; this tool is then swung clear of the work and the back tool brought into play, which action cuts out the inside, and the ring is complete.

The lathe is run at from three to four thousand revolutions per minute, and when once it is set up, and the tools arranged to deal with the size of ring required, skilled labor is no longer needed.

Furniture Men to Rectify Tactical Error

Enthusiasm for Publicity Campaign Should Have Been Maintained—Would Have Stimulated Demand During Last Few Months When Business Was Needed—Likely to be Revived at Early Date

By THE EDITOR

The furniture industry is coming to the fore again. A provincial charter was recently granted the Home Furnishings Bureau to carry on as a non-profit-making association. This marks the first step in the rejuvenation of the Better Furnished Homes Campaign which flourished for a short while last fall.

In deciding to go ahead with this general publicity work, the furniture men are well advised. The small amount of advertising done last autumn seemed to fill an undoubted need. It, certainly, caught the fancy of the retail dealer and created a feeling of co-operation and goodwill that augured well for the future of the furniture industry and for the relationship which exists between dealer and manufacturer. In addition, it succeeded in creating a demand for furniture.

Showed Gratifying Results

Exception may be taken to this last assertion, but it is none the less true and is borne out by letters from retailers which are on file at the office of the Bureau. The extent or strength of the demand thus created is open to question. In the opinion of the writer it was such that the stocks in the hands of the retailers to-day are at a very low ebb, and if the campaign had not been allowed to lapse, the furniture buyers would have found it necessary to enter the market before this and the furniture industry would not have experienced such a slump as that from which it is just recovering.

To have enabled the furniture dealer to dispose of his surplus and reduce his stock, without accepting a heavy loss at a time when other merchants were sacrificing profits and goods in a vain endeavor to keep things moving, is to have accomplished something worth while. That the furniture retailer did not immediately enter the market and replenish his stock was due in part to two factors. One was the general air of uncertainty which pervaded the whole industrial life of Canada because of the fact that new low price levels were anticipated, and the other was that the Publicity Campaign inaugurated by the furniture manufacturers, had been allowed to lapse. This latter fact naturally made the dealer wonder if the demand for furniture would fall as flat as it had for other lines.

Invest in Publicity

Another disturbing feature was the price reductions made by the manufacturers. The first cut in furniture prices was warranted by a corresponding decrease in manufacturing costs. This tended to have a steadying effect on the whole industry and to stimulate business. When the retailers had made up their minds to buy and were about to enter the market, prices took a further drop. The result was to create another wave of uncertainty which is only just passing away.

If instead of slashing prices and putting into effect reductions ranging from 10 to 30 per cent., the manufacturers had seen fit to reduce prices, say, from 5 to 20 per cent., and had turned the other 5 per cent. thus saved over to the Home Furnishings Bureau for a sales compelling publicity campaign, the results would likely have surprised the most sanguine and would have worked out to the benefit of both the manufacturing and retailing branches of the industry. If a manufacturer is willing to contribute from 10 to 30 per cent. of his gross sales, for that is what a reduction in price amounts to, in an effort to stimulate a demand, why should he hesitate about donating from 2 to 5 per cent. of gross sales toward a campaign which cannot help but result in increased business? It is a question if the money invested in price reductions has been spent to the best advantage.

Should Make Furniture Popular

However, there is not much to be gained by harping on what has taken place. The campaign is being revived at a period when it will do untold good. Increasing the demand at a time when the stocks in the hands of the retailers are greatly reduced, simply forces the dealer's hands, compelling him to enter the market and replenish his floors. Another fortunate feature is that a similar campaign is about to be put over by the American furniture industry on a proportionately larger scale. With these two campaigns in full swing and everybody talking and thinking furniture and better furnished homes, 1921 and succeeding years should be furniture years.

Film Manufacture of Hardwoods

To impress the users of labor and to acquaint the public generally, with the extreme difficulty, expense and even hazard in manufacturing their product, the American Hardwood Manufacturers Association, of Memphis, Tenn., has offered for showing to conventions, colleges, schools, and other educational centers a two reel moving picture.

This picture, produced by the Atlas Educational Film Company, Chicago, embraces scenes in the swampy lowlands of the south and the Appalachian mountains. The entire journey of a log, from the moment the tree is cut down in the forest to the time it is turned out in finished board, is interestingly shown. The primeval wildness of the mountains lends a striking light on many scenes which are splendidly photographed and done in a soft sepia.

The felling of the big trees, how they are towed out of the almost impenetrable swamps, or brought down the steep sides of mountains across streams and over all sorts of natural difficulties are depicted in a way that surprise the layman spectator who probably never dreamed of the great trouble involved and expense incurred in producing the wood for his sideboard or his dining room table. The association has had many requests for showings.

A third reel made for showings to manufacturers, especially, has for its purpose the conservation of lumber. It particularly shows the great variety of table tops and small type furniture that can be made from "dimension" stock of former wastage. This picture, too, has met with cordial comment wherever it has been shown.

Engineering in Furniture Factories

Are Managers of Furniture Factories More Interested in Selling Than Producing? Principles Involved in Planning and Reorganizing Furniture Manufacturing Plant—How Efficient Layout is Determined

By B. H. Parks*

The woodworking industry, including the manufacture of wooden furniture, is one of the oldest industries extant and yet it has shown the least development and has been the slowest to adopt modern principles of manufacturing of any industry of which the writer has knowledge. There are several causes for this condition, the most important of which are the general lack of accurate cost data in all but a very few plants and the absence of technically trained men in the executive positions.

The lack of accurate cost data is naturally reflected in the margin of profit, which in the majority of cases has been so small that no surplus has been available for plant improvements and very little for even proper maintenance. In several plants which have come under the writer's notice, only such repairs have been made as were necessary to avoid actual breakdowns, and machinery, power plant equipment, lighting, heating, drying, sanitary facilities, etc., have been entirely inadequate and inefficient and would not be tolerated in even the average modern plant of most other industries.

In the several woodworking and furniture-manufacturing plant organizations that have come under the writer's observation, he does not recall a single man with a technical education or training. The development of practically all modern industries to their present high state of manufacturing efficiency has been accomplished by engineers, as witness the metal-working industry, and who would dare say that the metal-working industry would never have reached its present state of development without the guiding hand of the technically trained engineer?

This lack of engineering ability in the furniture-manufacturing organization shows its effect throughout the entire plant; in fact, the writer is convinced that the average manager of a furniture plant is more interested in marketing his product than in manufacturing it. Furniture is constantly changing in style, also most plants manufacture quite an extended line, and consequently a large variety of product must be handled in any given plant. A point which most managers overlook is the possibility of reducing the variety of parts to be manufactured through standardization of design, interchangeability of parts, and greater limitation of line. This reduction of variety of parts would not only directly reduce manufacturing costs but would also tend toward the development of automatic machinery, better utilization of raw product, economies in handling parts in process of manufacture, etc.

Influences Against Rapid Development.

It is not the writer's purpose to discuss the manufacture of furniture, however, but only to point out some of the influences which have militated against the more rapid development of the industry in the past, and then proceed to a discussion of some of the principles involved in the design of a new furniture-manufacturing plant and the improvement of existing plants. A furniture-manufacturing plant, as in fact any industrial plant, is in the final analysis simply a workshop for turning out a certain product of a specified quantity and standard of quality in a given time at a minimum of cost. While the problem is easy to state, the solution is very complex, and there are so many factors to be considered that the final solution must of necessity be more or less of a compromise.

The efficiency of any general plan for a furniture-manufacturing plant, or in fact any industrial plant, may be measured by the degree in which the following requirements are fulfilled:—

(a) Provision for proper arrangement of the necessary machinery.

(b) Provision for receiving, handling, storing, and transporting material.

(c) Provision for extending the plant and increasing manufacturing facilities without serious disturbance to the original plant or manufacturing routes.

(d) Provision for generation and transmission of power, light and heat.

(e) Provision for fire protection.

(f) Provision for comfort and accommodation of employees.

Before proceeding to a discussion of the above, let it be known that the writer does not lay claim to the discovery of any new engineering principles applying to the problem. The attempt is simply made to point out some of the important questions to be considered in the design of a furniture factory with suggestions for their solution. Neither is it intended that any one should attempt to design a furniture factory merely with the aid of the data and suggestions given herewith. Each plant is a problem in itself with certain factors unlike any other plant. Consequently the services of a thoroughly competent engineer to work out the general plan and multitude of detail involved will be found to be of the utmost importance to those about to engage in a new manufacturing venture.

Suitable Location for Plant.

The importance of the location and arrangement of a furniture factory has not generally received the attention their economic value should dictate. In small plants supplying largely a local market, equipment and arrangement are the prime considerations, but for large plants supplying a widespread market, questions of adequate transportation for both raw materials and finished product, labor supply, taxes, etc., assume great importance.

The furniture industry, the same as other industries, has tended to concentrate in given localities, as, for example, Grand Rapids, Mich. This concentration was originally due to nearness to the raw material supply. As the number of plants multiplied a good supply of skilled labor has accumulated, so that now, even when Grand Rapids is not so well situated as other centres as regards nearness to raw material supply, the labor market as well as a certain reputation attaching to Grand Rapids product has tended to increase the number of furniture-manufacturing plants in spite of the

*Address, Annual Meeting American Society of Mechanical Engineers, December, 1920.

fact that, theoretically at least, other centres would be more desirable from most standpoints. In general, however, the location of a furniture plant, as for most other types of manufacturing, will be dependent on the following considerations:—

(a) Transportation facilities for both raw material and finished product.

(b) Availability of raw materials and manufactured parts obtained from other industries.

(c) Labor supply.

(d) Financial considerations.

(e) Civic or municipal aids or restrictions to manufacturing.

The actual site will also be selected having the following considerations in mind:—

(a) Shipping facilities.

(b) Adequacy of area.

(c) Levelness of site.

(d) Availability of water supply and sewage disposal.

(e) Nearness of adequate housing or possibility of providing adequate housing for labor.

Having chosen the site the problem then devolves into one of designing the most efficient plant which the site chosen will permit. For many years it was the custom, and still is to a great extent, to allow the plant superintendent to design an entire new plant. While the superintendent may be an expert in manufacturing furniture and entirely competent to select the necessary tools and machinery, yet in most instances he is poorly informed regarding the most economical practice in power-plant construction, heating, lighting, construction of buildings, and the many other important questions entering into the design and construction of the entire plant. While the superintendent will be of great assistance in the work, yet in this day of specialization the design and layout of the plant should be intrusted only to engineers recognized as experts in this particular line of endeavor.

Proper Arrangement of Machinery.

Making provision for the proper installation and arrangement of the necessary tools and machinery presupposes that the kind, quantity, and quality of the produce have been decided upon and that due and proper care has been given to the selection of the machinery required in the manufacture of this product. Naturally the first consideration is the location of the lumber yard and dry kilns in relation to the incoming lumber to the factory. The location of the lumber yard will of course depend on the arrangement of railroad sidings. Several different plans for location of sidings may be possible for any given site and the most efficient layout can be determined only by close study of the factors entering into any given situation.

After deciding, at least tentatively, on the location of lumber yard and kilns this will ordinarily determine the point of entrance for the raw lumber into the proposed plant, and the next procedure will be to make a routing chart and thus establish the amount of floor space required for manufacturing purposes. Having determined the entry point for the raw material consideration should be given to each factory operation with the sequence required for manufacturing the product. The routing chart should list each separate part entering into the finished product, with the proposed volume of manufacture per unit of time, say, one year, and the sequence of operations required. Such a routing chart giving the sequence of operations will establish in a general way the sequence of arrangement of the various tools and machines throughout the plant.

As stated above, it has been assumed that all machinery has been selected and the next procedure would be to make a templet to scale of each article of equipment, such as all machines, tools, benches, racks, etc. Each templet of a machine should indicate the path of the product through the machine, the point of application of power, the position of the operator, and position of helper, if any. It will be assumed that the proposed main manufacturing building will be of the multi-storied type, for reasons which will be mentioned hereinafter, and consequently the width should not exceed 50 to 60 ft. to obtain proper daylighting. In laying out the templets of the machines, however, it may be assumed temporarily that the building will be but one storey high and the machinery arranged as though in a long building with everything on one floor. By using templets of the various parts of the equipment to determine the arrangement it allows the units to be moved about until a satisfactory arrangement is found, the marks on the templets allowing the machines to be set in proper relation to flow of product, power supply, lighting, etc.

Studying Layout of Equipment

After a tentative arrangement of the equipment has been completed a careful study should be made of how the product is to be transported from machine to machine, making proper provision for aisleways and location of trucks at machines to allow of efficient handling of material in and out of machines. Consideration should also be given to the necessity of providing spaces for accumulation of material between machines where the speed of handling varies.

The final arrangement of the templets will determine the amount of floor space required for machine rooms, and careful consideration should then be given to the location and size of store rooms, assembling, finishing, upholstering, crating, and shipping departments, factory offices, toilets, locker rooms, etc. With the approximate total amount of floor space decided upon, a tentative layout of the building may be made. The product of a furniture factory being comparatively light in weight, and consequently easily transported, a multi-storied building will in most cases be found the most economical from all standpoints, although 4 or 5 stories in height should probably be the limit. The various departments may then be arranged with machine room and shipping department on the first floor, additional machine room if required on the second floor, and assembling, finishing and upholstering departments on the upper floors, care being exercised to so arrange the various departments that the flow of product may be as direct and uninterrupted as possible through each department and then on to the next.

Factory Transportation System.

Upon completing the arrangement of the various departments the next problem will be one of transportation between the several departments on the different floors, which is accomplished ordinarily by means of elevators. In connection with the transportation problem, thought should be given to the possibility of using chutes, conveyors or small elevators from one department to another, thus establishing more direct paths of flow than could be obtained by using the main elevators and also reducing considerably the amount of handling required. In general, one elevator at each end of the building will be sufficient if the building does not exceed about 300 ft. in

length, particularly if the elevator equipment is augmented by means of conveyors or small auxiliary elevators as mentioned above.

The floor space and general arrangement of the main manufacturing building having been determined, the next decision to be made is the type of construction to use. This is somewhat limited to materials available, although in most centres where a furniture factory is likely to be built the ordinary forms of construction such as reinforced concrete, slow-burning mill, or steel frame, will be found applicable. Reinforced concrete is rapidly coming into use as one of the most economical types of construction, when all factors are considered, and yet the writer regards the slow-burning, heavy-mill type of construction as particularly adaptable to a furniture factory and for the reason that in addition to its slight advantage in first cost it has the decided advantage of allowing the installation of machinery, limeshafting, lighting, heating and plumbing equipment with a minimum of labor and expense and also allows alterations to be made much more readily than where reinforced concrete construction is used.

Mill construction is oftentimes confused with the light and cheap frame structures frequently erected for factory purposes and consisting of light brick walls, small wood posts and beams and light joists placed on close centres. Good slow-burning mill construction should not be maligned by using the name in connection with such construction as mentioned above. True slow-burning mill construction consists of good substantial brick walls and pilasters, wood columns or posts not less than 10 in. on a side, heavy wood beams or girders, floor and roof joists at least 8 in. in smallest dimension, and heavy plank floors and roof at least 3 in. thick. Such construction properly designed and erected has, in the writer's opinion, many of the advantages for factory purposes of reinforced concrete and even some advantages which reinforced concrete does not possess.

It seems unnecessary to more than mention the advisability of so designing a building as to obtain a maximum of daylight and ventilation through the use of large windows; to enclose elevators and stair wells in fireproof towers, with all openings thereto fitted with fire doors; to provide exterior doors to stairs to use in case of fire; and to work out all details of design and construction from the standpoint of overall economy and efficiency instead of cheapness.

(Concluded in the April Issue)

Train Foremen to be Better Managers

Foreman Holds Key Position to Production—Should be Trained to Interpret the Management—Assist in Securing All Season Efficiency

By P. L. Burkhard*

The future of our industries, whether they be machine shops, foundries, rolling mills, ship-yards or woodworking plants, rests in the hands of the management. One of the important and too frequently overlooked branches of management is that of foremanship. The foreman in the yard or in the plant holds the key position to efficient production. He is the point of contact between the man at the top and the men who do the work. The very position he occupies gives him power far greater than is usually recognized. He can through his own abilities and effort, or lack of ability and effort, cause a business to either loose money or make money. There is today a tremendous opportunity open to progressive manufacturers to train their shop executive force to be better managers.

The foreman should think and act just as the general manager would think and act, if he were on the job, as daily problems arise. It is high time, therefore,that buisenss men grasp the open opportunity to make their foremen better managers, or, as I like to express it, make them industrial engineers upon their own jobs. Train them to see the possibilities for improvement that stare them in the face, and train them to make these improvements themselves.

The Logical Efficiency Man

Foremen are as a rule selected for their jobs because they have been with the concern a long time, or are good workers, or for any or more of thousands of illogical reasons. Few men have been chosen for the foreman's job because they are good managers or because they can see and act as managers themselves do. They have served no apprenticeship for the important job of foreman. They lack training. Why not make it possible for them to become acquainted with the principles and practices which make for efficiency in the shops? Although very few foremen recognize the fact, the efficiency men of any industry are the department heads, the true key men of the industry. The only reason I can see why many foremen do no function as such is because they do not accept the facts.

Now this does not mean that foremen should undertake the duties of the production manager or the planning department, or even that experts should not be retained for factory reorganization. But it does mean that foremen should function more closely in relation to the particular work of whatever efficiency department may be operating. Many foremen fail to accept the responsibilities, and many managers neglect showing these responsibilities to the foremen, of maintaining the highest batting averages which a plant is capable of hitting.

An Aid in Present Situation

The world is confronting a new situation today, and very few of us know what is going to happen next. In many plants production has been cut and the trend is still downward. This means something to everyone of us. It is going to take a lot of common sense to pull us through this period of industrial readjustment. Since the problem is an industrial one there is no reason why foremen should not be expected to contribute their share in pulling us through.

This brings us to the question as to why the foreman is the logical efficiency man. All engineering has to do with two major processes, utilization and elimination. When you translate these terms into production it means simply that the greatest possible use must be obtained from every element which goes into production, and that every waste which may be

*Burkhard Griswold Co., Cleveland, Ohio, Industrial Training Consultants.

common to any one of the same elements should be minimized, or eliminated if possible. As efficiency engineers or production men, the foreman should accept the responsibility of getting the maximum result. This is the first step, utilization. And as he succeeds in getting the maximum result, he consciously or unconsciously takes the second step, elimination. It does not require much knowledge of mathematics to figure out that if a foreman makes a study of the existing wastes, and cuts them out, the maximum return will be greater.

All Season Efficiency

This maximum return or result is just as essential at one time as at another. Unless the factory is getting the maximum return at every season of the year, consistent with conditions of the season, good dollars and cents go down into the bottomless pit never to be coaxed back. Where wastes exist the maximum return is not being secured. No matter whether we are in a period of increasing, decreasing or constant demand for our product, it is essential that the lowest unit production cost be obtained. This is just another way of saying the same thing, but I want to hit it from every possible angle because the other day a foreman told me that his firm "didn't need any more efficiency because production had been cut 50 per cent and a lot of men had been laid off."

If he had tried to prove his argument he would have had to take the stand that 'because business isn't as good as it was we don't care what the costs are, let 'em go up." Now do not misunderstand me, he didn't say that the firm did not care what the costs were, but in effect that is what his argument amounted to. To carry the same theory further he would have had to have said that if the unit cost of a product was $1.00 when business was good, everybody could let up when business fell off and the unit cost could go up to $1.10 or $1.20.

Time for More Efficient Production

This foreman with whom I was talking was sure that his firm did not need any efficiency. Of course, he was wrong. Yet maybe the blame was not all his. Surely no one had explained to him the truth of the situation. He was speaking for his management. He was interpreting the management, yet he had a wrong conception of that for which the management stood. This man surely was not the efficiency man on his job. He had a wrong slant on production. If he talks that way to his men the firm certainly would be better off if he was employed by a competitor. At this very time, while he was expressing his opinion to the effect that efficiency was no longer needed because business was dull, the management was trying to figure out how the unit cost of their product could be reduced from $1.00 to $0.90 or even $0.80. The management recognized that now was the time for more effective productivity, greater efficiency.

Foremen who are the efficiency engineers in their own departments know something of the economic laws which underlie industrial activity and readily see that if a concern or even a department is to be operated as a paying proposition there must be serious thought for efficiency. They know that in the dull season it is more necessary than ever that the pennies be looked after. If there is any time when leaks and losses may be overloked it is when orders are so plentiful that the company can throw $1000 away without mising it. I do not mean by this that it is ever justified. There can be no justification for permitting waste, leaks and losses to occur within the factory walls. A dollar wasted is a dollar lost, and today waste is nothing short of criminal.

(Concluded in the April issue)

Identification of Different Oaks

Over fifty species of native oaks assume the proportions of trees, and about twenty-five are used for lumber. After the oaks are cut into lumber, there is no means known to the U. S. Forest Products Laboratory by which they can be identified as to exact species. By examination of the wood alone, however, it is easy to separate the oaks into two groups—the white oaks and the red oaks; and for most purposes, fortunately, it is not necessary to classify them any further. The oaks all average about the same in strength, but those in the white oak group are much more durable under conditions favorable to decay than those in the red oak group.

The white oak group includes true white oak, bur oak, cow oak, post oak, overcup oak, and chestnut oak. The red oak group includes true red oak, yellow or black oak, scarlet oak, Spanish oak, Texan oak, black jack, water oak, willow oak, and laurel oak.

The color of the wood is a ready but not absolutely reliable means of distinguishing the white oaks from the red oaks. Red oaks usually have a distinctly reddish tinge, especially near the knots. The wood of the white oaks is generally a grayish brown; but occasionally a reddish tinge is found in white oak.

For more accurate identification it is necessary to examine the pores of the wood. These will be found as tiny holes on a smoothly-cut end surface, the largest being visible to the unaided eye. They are not of uniform size throughout each growth ring, but are considerably larger in the wood formed in the spring, decreasing in size rather abruptly towards the summerwood. The large pores in the springwood of the heartwood and inner sapwood of the white oaks are usually plugged up with a froth-like growth called tyloses, and those of the red oaks are open.

To tell for a certainty whether a piece of oak belongs to the white or red oak group, cut the end grain smoothly with a sharp knife across several growth rings of average width. With the aid of a hand lens examine the small pores in the dense summerwood. If the pores in this part of the growth ring are plainly visible as minute rounded openings, and are not so crowded but that they can readily be counted, the wood belongs to the red oak group. If the pores in the summerwood are very small, somewhat angular, and so numerous that it would be exceedingly difficult to count them, the wood belongs to the white oak group.

Don't Stop

When someone stops advertising,
Someone stops buying.
When someone stops buying,
Someone stops selling.
When someone stops selling,
Someone stops making.
When someone stops making,
Someone stops earning.
When someone stops earning,
Everybody stops buying.
Keep going.—Printer's Ink.

How to Bring Down Factory Costs

Effect of Reduction in Certain Items on Final Factory Costs—Slight Cut in Wages May Have Startling Result—Suggestions Worth Pondering

By WM. A. BABBITT
General Secretary, National Association of Wood Turners, Inc.

The problems presented in adopting new price levels is not at all as simple as some loud shouting buying interests would have us, who have to stand the gaff, believe. The assumption is that if materials fall say 25%, and if wages contract a similar per cent, the factory cost falls 25%. We may say, in passing, that the manufacturer who lets the buyer do his cost figuring certainly has no right to complain at the result the buyer shows by his figures. But we maintain that this procedure puts too great a strain on the morals, to say nothing of the intelligence, of Mr. Buyer, to recommend it for general practise.

Let us look again at a general example made up on the standard cost formula:

Overhead 200% on direct labor	20.00
Direct Labor for the Job	10.00
Raw Materials Cost	$10.00
Total	$40.00

In this formula, it must be remembered that all figures are assumed and that the overhead per cent is taken arbitrarily at 200, and that actually this figure will vary with the individual plants, probably within the limits of 180-275. Overhead per cent is ratio of all expenses of doing business other than direct labor, to the direct labor. If the cost of raw materials drops 25% and other costs remain the same, then obviously the cost drops to $37.50, or sustains a drop of 6¼%.

Effect of Drop in Labor

Suppose the cost of labor drops 25%, what happens then? A lot of things that no one ever thought of until recently. It looks on the face of it, that this cut in wages might nip off another $2.50 from the cost. But the fact is that it is quite as likely to add to the cost.

You have to consider two outstanding variables or hazards of the manufacturing process. In the first place, there is the cost hazard of speeds. A cut in wages always has a tendency to slow down the production speeds of the plant:. It discourages some workers and makes others surly. So every manufacturer must study the result, rather than the face figure of every cut in wages. In the second place, you must consider the matter of "overhead." It is hard to see how anyone who fails to pivot all his expenses on his direct labor is going to answer this question, viz., of the effect of a wage reduction on his overhead.

If it were possible for you to go right down the entire list of items in your expense account, and slash the whole list for a 25% reduction, all would be well. Your 200% overhead would fall to 150%, and your factory cost would fall the 25% which the buyer demands. But it is more likely that your overhead per cent will not go down. It will almost certainly go up, or at best remain constant.

Many Items not Coming Down

Look at the items in your list. Fully half of them are accounts that cannot be cut, but are bound to be higher, such as taxes, insurance, depreciation, sales expenses, many kinds of supplies and the like. Then there is the matter of salaries. Are you cutting your own salary 25%, and your bookkeeper and your factory manager, and so on down the line? There does not seem to be much in the overhead to cut except the wages of unskilled labor, which procedure appeals much more keenly to your customer than it does to you.

If you leave your overhead substantially intact, then your overhead ratio is going to climb nearly enough to wipe out your wage cut. Your overhead ratio expresses the relation between the amount you pay the men, who conduct the actual manufacturing operations in your plant, and the amount required to give the supporting service which makes these manufacturing operations possible. You will at once see that unless your overhead is reduced to match the other reductions of wages and materials, you will be a long way from securing the desired reduction in cost. Assuming that your overhead remains intact, and your overhead is 200%. As this is the ratio of expense against ten dollar labor, you perceive that against seven fifty labor, the per cent. immediately leaps to 267%.

Furthermore, when we come to study the lumber, we find that our raw material prices cannot be reduced. It is true that there are bargains just now for buyers who dare to buy. But as soon as buying starts, lumber will immediately resume the price level which its scarcity and cost of production will inevitably command. In most cases the increased cost of freight fully offsets the decreased cost of lumber.

What a Second Glance Shows

Let us set up the cost formula again. To be very conservative, we will grant that labor can be counted on for the coming year at 25% lower wages. Let us assume that sufficient reductions in the wages of supporting labor can be made to effect a net drop of 15% in overhead. We cannot concede that lumber can be figured at lower costs. The formula will now read:

	Now	Before
Raw Materials	$10.00	$10.00
Off 25% Labor	7.50	10.00
Off 15 pts. Overhead (252%)	18.90	20.00
Total Cost	36.40	40.00

This study is given to enforce the lesson that the man who dares to make a price reduction of 25% until he has proven that he can effect the necessary reductions in every item of cost in his overhead as well as in his labor and materials is taking the kind of hazard from which the Good Lord is said to protect only children and fools.

Getting at Root of Problem

On the other hand, just see what happens, when, instead of cutting wages and the standard of living of your employees, you go after them and get an average 30% more production per man on the same outlay of overhead. Let us assume that the cost of $40.00

represents the total expense involved on a day's run of ten hours. If your operator is able to complete this ten-hour job in seven hours, you have gained three hours of direct labor, or $3.00. You have further gained the overhead on this labor, or $3.00. You have further gained the overhead on this labor, or $3.00. Your cost formula will show as follows:

Raw Materials	$10.00		
Direct Labor	10.00	less	$3.00
Overhead	20.00	less	6.00
Totals	40.00		9.00 gain
Net Cost	$31.00		

In other words, the 30% increase in production, without any reduction in wages or overhead, earned enough saving in wages and extra distribution of overhead to give you the base for a 22½ per cent price reduction. A careful trimming of expense accounts should enable you to take care of the remaining 2½%, effecting a total reduction of 25%.

In designing a box for a certain commodity or to serve a certain purpose the high piling hazard is often overlooked. Very often the specifications of material for a box do not call for lumber of a grade and thickness that will withstand the strains of high piling. Such a box might carry its contents safely under ordinary conditions, but might fail if stored in high tiers in a warehouse. The point is worth considering.

Departments Responsible for Own Showing

Woodworking Plant of Laidlaw Lumber Co., Organized Along Progressive Lines —Accurate Costs on All Work—System and Orderliness Outstanding Features

Many woodworkers operating a planing mill and woodworking plant in connection with a retail lumber yard must often wonder if the game is worth the candle. Sometimes it is and sometimes it isn't, for at times the yard makes all the profit and carries the planing mill, while again the plant carries the yard. The ideal way is where each department is able to stand on its own and show a profit at the end of the year.

This is what occurs in the case of the R. Laidlaw Lumber Co., Toronto, who operate a large planing mill and woodworking factory in connection with their West Toronto yard. Here the woodworking end is conducted as a separate industry and not only shows a profit but provides an outlet for a large quantity of lumber, being the best customer the yard has, brings trade to the yard and further assists by turning odd lines and slow-moving stock into saleable lines. To do that, it goes without saying, that the plant must be well equipped, highly organized and conducted along systematic, efficient lines.

View in Sash and Door Department.

Divided Into Separate Departments

In this particular instance the whole operation is conducted as three distinct departments or organizations, each independent of the other and each responsible for its own showing. The three divisions are yard and planing mill, factory proper, and warehouse. The yard, which consists of about 10 acres with numerous sheds and storehouses, usually carries a stock of some 7,000,000 of 8,000,000 feet of hard and soft woods consisting of Georgia pine, fir, spruce, pine, heavy timbers in such woods as oak, fir and Georgia pine, and such cabinet woods as mahogany, walnut, oak, etc. About 500,000 feet of kiln dried hardwoods are usually on hand. It is well provided with trackage, there being three separate sidings. A steel crane, which operates on the tracks, is used to handle heavy timbers, move cars and load the automobile trucks and teams.

In loading the trucks the material is first loaded on the yard carts or two-wheeled trucks. These are moved to a suitable parking area. When the empty truck returns to the yard, the crane lifts the load from the cart and deposits it on the truck. This cuts down the amount of time consumed in loading the truck, reducing idle time to a minimum.

Equipped for all Kinds of Work

The equipment in the planing mill consists of 2 power feed rip saws, 4 stickers and moulders, Yates planer, 16 in. jointer, 60 in. resaw, Woods timber sizer and dowell machine, together with the usual filing room and grinding equipment. An overhead crane is used to handle the material around the planer and resaw. This department takes care of all dressing, sticking, resawing, milling in transit and work of a similar nature.

The factory or woodworking plant proper is a modern up-to-date, well lighted, department. The work here consists of high-class interior work such as bank and office fixtures, interiors for residences and stores, veneered doors, panels, special doors, and sash, hand railing, newel posts and articles of a similar nature. The material for this work is all purchased from the yard, with the exception of the veneers, which are bought direct. This organization is divided into four departments; breaking out, sash and door, glue and veneer and bench.

In the breaking-out room the equipment consists of 2 rip saws, 3 cut-off saws, 10 in. Cowan sticker and a 26 in. planer. The sash, door and cabinet-making equipment consists of such machines as shaper, lathe, band saw, cut-off saw, Cowan moulder, 2 rip saws, 2 variety saws, Whitney planer, 2 jointers, 3 drum Yates sander, power door clamp, drum and disc sander, belt

sander, 2 hollow chisel mortisers and relishers, door relisher, band saw, 2 tenoners, chain mortiser, sash and door sticker, Kelly router, etc., while a Francis hydraulic press, glue mixer and hand presses comprise the glue installation.

System and Efficiency

All work is handled along systematic lines and there is a noticeable absence of congestion and confusion. In fact this is one outstanding feature of the whole organization and is due entirely to the manager, Mr. W. Warren, who might be termed a "crank" on system and efficiency. He has not, however, allowed his enthusiasm for orderliness to carry him away, with the result that while his organization is efficient and highly productive, it is not over systematized and top-heavy, as sometimes happens.

Cowan Sticker in Laidlaw plant. Note brightness of shop.

Whether one inspects the plant, yard, or warehouse, everything is as it should be. In the yard the lumber is piled on permanent foundations. The unit for piling is 4 ft. 4 in. wide. Each pile bears a tag which gives the particulars of the stock, pile number and date piled. A perpetual inventory is kept which shows the amount of material on hand and where located. Another feature is that small sheds are located at convenient places in which the piling sticks are kept. This increases the life of the stickers and does away with unsightly piles of sticks which are an adjunct of the ordinary yard.

Every provision is made to guard against fire. Hydrants and fire buckets are located at convenient points. In addition keeping the floor clean and free from litter lessens the fire risk. In addition to prevention and fire-fighting appliances a fire brigade has been formed among the employees, under the leadership of R. G. Millen. This brigade is drilled frequently and is prepared and trained for all emergencies.

Many H. P. Saved

The power plant consists of 2, 100 h.p. boilers and a 250 h.p. Wheelock engine. This is supplemented by a number of electric motors. Sufficient fuel, in the shape of sawdust, shavings and cuttings, is made to keep this plant going, and is forthcoming practically at all seasons. In fact a large proportion of the shaving made is baled and sold, some of it going to U. S. centres. The shavings exhaust system, which include separate units for sawdust and shavings, were installed by the Toronto Blower Co., Toronto. In connection with the distribution of power, it is interesting to note that all hangers are equipped with Chapman ball bearings. This installation has resulted in 70 h.p. being saved and applied to manufacturing purposes. Formerly the power plant was taxed to full capacity, but since the ball bearings were put in place, several new machines have been connected up, including a large fan, without overloading the engine.

The factory, planing mill and warehouse are steam-heated. A vacuum system, working under very low pressure and using exhaust steam, is the system adopted. The dry kilns consisting of a battery of 5 compartment kilns of the modern humidity type, with a monthly capacity of 150 feet, are also connected with the exhaust steam.

When an order for detail work is received, the order is made out in triplicate, one copy going to the shipper, one to the cost clerk and one filed. A shop order is then made out to which are attached sketches, blueprints, etc., and given to the shop foreman who in turn passes it to the detail man. This latter employee makes out cutting bill. The cutting bill and shop order follow the work through until complete.

Special Attention to Costs

An accurate account is kept of all costs. This applies to all departments and the different branches of the organization. The cost figures and cost recapitulation are carefully studied and analyzed in an endeavor to detect any weak spots or any operations

Francis hydraulic press for door and panel work.

which are costing too much. If any discrepancies are found, remedial measures are applied. This is using a cost system to the very best advantage, for it not only gives accurate figures on the various costs but really is used as a gauge by which the efficiency of the plant and its departments are measured and compared. These figures also give good information on which to base all estimates.

Some of the high-class jobs recently completed include interior fittings for the Bank of Commerce and Royal Bank buildings, Toronto, and for buildings erected by the Walkerville Land & Building Co., Walkerville, Ont., London Trust Co., London, Ont., Mutual Life, Waterloo, Canadian Woolens, Peterborough, Ont., Toronto Hunt Club, and others.

How to Augment Supply of Skilled Mechanics

Planing Mill Operator Outlines Views—More Attention to Training Apprentices—Co-operation of Technical Schools—Some Pertinent Suggestions

An interesting discussion with regard to the training of mechanics for the woodworking industry took place at the meeting of the Ontario Retail Lumber Dealers' Association held in Toronto recently. That this question should come up at all is a hopeful sign for it shows that the operators of planing mills and woodworking plants are aroused to the fact that some concerted action must be taken to ensure an adequate supply of skilled hands. It was brought out that the technical schools stand ready to co-operate to the fullest extent possible and it would seem as if the situation lies in this direction. Another point is that were the woodworking industry raised to such a level that higher wages could be paid, good men would be attracted to this calling. This can only be accomplished by close co-operation between woodworking employees.

Alex. Rhind of the Simpson Planing Mill, Toronto, who has given this subject considerable thought gave a short address as follows:

To re-open the question, which was touched upon at our last convention relating to the scarcity of well-trained bench and machine mechanics and the consequent lack of stability and production in the industry which we represent, and to create discussion here which may further ways and means by which the situation may be relieved.

Supply of Mechanics not Adequate

That this scarcity exists in normal times to our disadvantage is admitted and proven by the readiness with which an employee will lay off a day, rustle around to another shop, tell a story and get an offer of an advance in wages. He may start in the new job, but chances are that he goes back to his boss and states he has been offered more money. His boss meets the raise and the man stays till things look ripe for another touch, and believe me touches were close together last summer.

As to lack of efficiency, increasing and ever-varying costs in all departments in time required for stock or standard operations is proof enough. I think that, because we are not making effort to train beginners and men to our line of work, we are to blame. I think that we Canadians are away behind our old country folks in this regard. We are too busy, or we think we are, so have not taken the interest we should to add to the supply of help we have and need, or to replace those who work for us and who retire rich, start garages, grocery stores, real estate offices, speculative builders, etc. In view of all this, I think we might well discuss this question fully and take such action as we may decide will serve our interest.

Take an Interest in Beginners

I believe the printing trades have an understanding or agreement with employees, whereby all apprentices are indentured for a period of years at fixed wages, the employer advancing the apprentice as he becomes proficient, and after the first year he is sent to a Technical School as a part-time student at employer's expense. As the printing trades do not keep "open shop," I am not sure that this would be suitable for us to adopt, because the fixed purpose of "Organized Labor" is to retard production and their well-paid organizers are supplying a constant stream of propaganda to the end that labor may become scarce and dear.

Perhaps our better plan would be to each make an effort to place some beginners in our shops and factories and then to see that their interest was maintained, work not allowed to become monotonous for them and that they do not become discouraged through lack of interest, through interference or from insufficient wages. It would be a satisfaction to any of us to know that we had made a good mechanic and a useful citizen out of a beginner. Some say, "Well, a year or two, and just as he becomes of some use to me, here he leaves me and goes to work for Jones for a few cents more." Possibly, but then you may get one of Jones's boys for your shop. Jones can't keep all the boys unless he is like a superintendent of a concern I was with in Buffalo some years ago. This superintendent had a penchant for boys, and on our floor there were perhaps as many boys as men working. One day the boss, a little German, who was not at all a practical man, walked through and called to the superintendent. "John" he said, "Iss all dees boys voork by us?" John replies, "Oh, yes, some of them are growing quite smart too." "So, so," replies the boss. "Well, John, I giff you to understand right now dat dis is von sash and door factory I put my money in, I aint running no kindergarten." However, there is a happy medium in all things, and our shop here is a long way from being a kindergarten, at least in regard to the matter we are discussing.

Part of Time in Schools

In large centres, such as Toronto, Hamilton, Ottawa, in fact any of our cities, could not a scheme be devised whereby a boy could serve, say, a year or two with the concern and when he had acquired some knowledge and experience, be transferred to another shop and another until he became proficient and acquired confidence in himself.

Dr. McKay Offers Suggestion

Dr. A. C. McKay, principal of Central Technical School, Toronto, said that he had listened with interest to the remarks of Mr. Rhind and that they had opened up the whole question of industrial education. He said if the woodworking manufacturers felt that they were not getting sufficiently skilled apprentices they might take on three boys instead of two, and let the school have each apprentice a couple of half-days every week. The school would give them definite, special instruction and could do with them much better than the shops in teaching them to make and read drawings, etc. The expense of such instruction was borne by the citizens. Employing printers are doing this with those serving their time in the print shops, and woodworkers could do the same with their boys.

In the discussion which followed Dr. McKay's remarks, it was felt that the woodworking industry should take more interest and avail itself of more of the advantages of the school and that also men in the shops should take more pains and time in teaching boys.

Estimator or Guesstimator — Which?

Toronto, Feb. 22, 21.

Editor, "Canadian Woodworker,"

It is generally conceded that sash, door and interior woodworking plants are unprofitable investments, to be shunned by shrewd business men and hardheaded investors. As far as the memory of man can go back, and even further, we have records of hardworking men spending their whole lives, trying to build up a business in this line, and then going down into old age disappointed and discouraged because their dreams had never matured, passing out as poor, if not poorer, than when they commenced. Even today we see this same old, time-worn tragedy enacted.

How many woodworking factories can lay claim to be on a paying basis? There are a number who have been stimulated during the past few years by high prices and excessive business. When, however, the whole system is reduced to a normal basis and business is procured solely on competitive lines, I venture to say that a similar state of affairs, to those existing before the war, will be very much in evidence.

One naturally asks why this should be so? Simply because we have not kept pace with the times. The methods employed by our grandfathers have been handed down to us, and, I am sorry to say, retained in all their former crudeness, without even an honest attempt being made to improve them. Although every other line of industry has made rapid strides, whilst we, the custodians of this time-honored business, have been content to shamble along in a rut. This, of course, while applicable to a large majority of factories, is not true in all cases. We have some up-to-date plants in operation.

What is it that today is holding back the progress of our factories? Is it that we are content with an imperfect knowledge of our business, and that we do not handle it scientifically? Until this is remedied, we will not obtain the best results.

In every walk of life we must have a gauge or measure as our rule or guide. The cost system is our gauge in our manufacturing operations. Any firm operating without an up-to-date cost system is acting just as foolishly as the captain who tries to sail his ship without a compass. Without cost figures you can but hazard a guess as to the value of any piece of work. You might be right but more likely wrong. The cost system is the rule by which a modern estimator measures the value of the work he is estimating, and so without the same, estimating is only "guesstimating."

Very few factories know what their waste is on different types of work. I have had old experienced men tell me that 25% was the maximum waste on a given job, when I have proved it to be 45%. I have also seen high class joiner-work where the lumber value was 50%, and the labor value 50%, accepted at a price that barely covered the lumber value on a retail basis, the labor being practically thrown in. Such a state of affairs can only bring ruin, in addition to disrupting business and creating unfair competition. This would not likely happen if an efficient cost system were in operation.

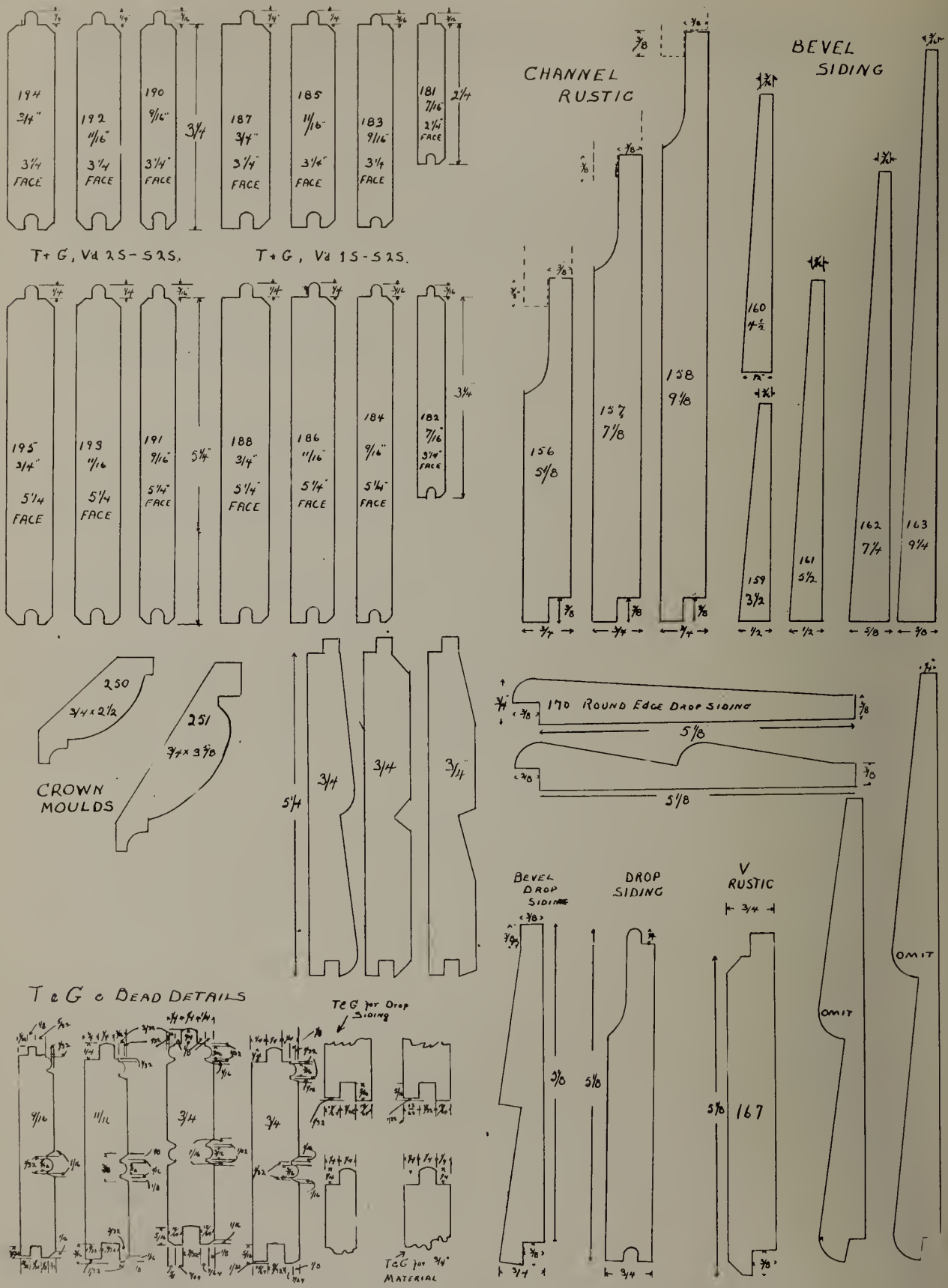
My advice then to all who operate woodworking plants is this:—"Know what your work is costing."

I am intensely interested in the woodworking industry; my whole life having been spent in this and allied lines. This article is prompted solely by a desire to serve my associates in our endeavor to raise ourselves to a more dignified plane; eliminating all elements of doubt and uncertainty, so that when slump periods are experienced, we may find ourselves firmly braced and entrenched and when good conditions present themselves, we will be able to make the most of them, handling our maximum of work, and to a large extent creating a reserve against less propitious times.

Should this letter prove interesting to your readers, I will gladly contribute again in future issues, entering into some of the details of cost, and outline my idea of a systematically operated plant.

Yours truly,

W. Warren.



Suggested designs and size for drop siding and sheathing in cluding details of tongue and groove.

Is Standardization of Mouldings Desirable?

Small Operators See Threat in Proposal to Adopt Uniform Designs—Advantages and Disadvantages of Such a Move—Uniform Door and Window Openings Desirable

By J. R. Weir

The adoption of standard designs and sizes for mouldings and other forms of woodwork is not favored by all woodworkers. This refers particularly to the smaller operators; for the larger organizations, those catering to a wider field, realize that it would be to their advantage to have uniform designs which were recognized and accepted by woodworker, contractor and architect.

The attitude of some of the smaller operators, and there is something in their contention, is that the universal recognition of certain basic designs and sizes would leave them at the mercy of the larger plants, which through larger output and, perhaps, better organization and equipment, are in a position to manufacture more cheaply and who, because of greater turnover, can operate on a smaller margin of profit. As long as each plant brings out individual designs, which are, at least, recognized and accepted in their immediate vicinity, just so long will they be able to compete successfully with outside competition.

Carrying this thought further the smaller operators consider that were they to purchase mouldings and detail work of that nature they would not have sufficient work to keep their plants going. In other words, the work involved in manufacturing such material is needed to provide a quota of the work for equipment and operators. What if they could buy this stock at a figure that would enable them to make a greater profit than if the material had been run in their own plants? One point is that the production of mouldings and trim offers an outlet for certain materials which accumulate around a plant and which does not command a ready sale. If this way of working up such stock were found to be unprofitable the material would probably have to be sold at a loss.

There is another phase to standardization and that is, would it result in reduced manufacturing costs and consequently a lower-priced product? Would such drop in the price of building material, for that is what it would amount to, have any marked effect on the building situation? It is claimed, and not without some show of reason, that if all the mouldings, flooring, doors, sash, frames, etc., could be standardized, it would effect economies which would have a marked effect on building costs, particularly residential work. This is particularly true with reference to the adoption of uniform doors and window openings, permitting the woodworker to cut all frame and trim material to the necessary sizes in quantities, taking full advantage of quantity production and eliminating a certain amount of waste, for such material could be cut to the very best advantage with a maximum of loss. On the job the work would be accelerated for all the carpenters would have to do would be assemble and attach the trim, etc., the cutting having been done at the factory.

A number of other advantages might be cited, but this article is not a brief in favor of standardizing but is written rather with the idea of informing the readers of the "Canadian Woodworker" as to the trend of events and of giving them something over which they may ponder.

In the past standardization was not practical and in fact, almost impossible of attainment. This was due largely to the way the contour of the sticker and moulder knives changed every time they were sharpened or ground. This was so marked that the shape of a moulding would undergo a decided change during a long run, unless the knives were removed at frequent intervals and reground to their original shape. Thus it often occurs that no two runs in the same plant, produce mouldings that correspond exactly in every detail. In any centre where certain designs and sizes had, through long usage, become recognized as sort of standard or stock designs, it is found upon comparing the product of one plant with that of another, that the variation in size and contour might run as great as ⅛ in. and even ¼ in., although these mouldings were ostensibly the same. This cannot be called standardization, for were these designs made uniform to one recognized pattern, the product of one plant could be placed end to end with that of another factory and would coincide in every detail without the minutest variation. It is this latter idea of standardization for which the various organizations behind this movement are working.

The manufacturers of knives and cutter-heads made a valuable contribution toward this objective when they brought out the special milled knives and cutters which are now on the market. Using milled cutters a plant on the Atlantic coast and another one on the Pacific coast could make mouldings which would agree in contour, without the slightest variation. There might be a difference in size due to the way the back was cut but the face members would be the same. If the manufacturers of milled cutters were to get together and agree on certain designs and thus to a certain extent standardize them, it would tend to gradually bring about a universal recognition and adoption of certain basic designs. In this connection it would be necessary to bring out standardized jigs and gauges which could be used as a means of comparing the product of one factory with that of another and which would ensure that the moulding turned out by each one corresponded in all detatils.

It makes little difference whether the woodworker or knife manufacturer takes the initiative, for the result would be practically the same in the long run. It would appear as if certain standards will through time, be adopted or accepted by the woodworking industry, and it certainly will be interesting to watch the developments along this line which may take place during the next year or two.

If every piece of furniture had to be sanded by hand what an army of boys some firms would have to employ.

What happens if the backs are higher than the front of the teeth; will the saw cut?

Circular Saw Greatest Hazard in Industry

Messrs. Tobin and Lovett, of Industrial Association, Tell Furniture Manufacturers Plain Truths in Addresses Given at Annual Meeting Furniture Manufacturers Association, Toronto—Employers Responsible for Large Percentage of Accidents—Compensation Board Requested to Take Action Against Worst Offenders

As I understand it, you are gathering here today for an annual meeting and, no doubt, during your deliberations you will rehearse the profits or losses of the past year and anticipate the results of your efforts for the coming year. Therefore, anything that will result in additional profit to yourselves or greater satisfaction in connection with your undertakings might ordinarily be considered an attractive proposition. I cannot promise to all of you that what I have to say is pleasant, but I think you will admit, after I have given you some information that I have here, that there exists a condition in your plants in Ontario for which you are, at least to some extent, responsible.

In the classification arranged under the Workmen's Compensation Act, what is known as Class 3 (embracing furniture, piano, organ and kindred industries) there were reported 655 accidents during 1920. The outstanding cause for these accidents may be named first, second, third, last and all the time, circular saws. One hundred and seventeen of these accidents happened on saws.

Attitude of Employees

Now we have among the firms mentioned, as near as we can estimate, about 25% who are willing to accept and put into practice any suggestions given them for the prevention of accidents. They have their saws guarded and they insist on the guards being used. The remainder are equally divided and may be classified as follows: 33 1-3% good promisers, 33 1-3% good arguers, and 33 1-3% willing to pass the responsibility to the workman.

In the first division of the above we find the manufacturer quite willing to procure guards and undertake to do what he always admits is necessary, but we find it quite difficult to keep him up to the mark in respect to his promises. We find 33 1-3% who are ready to exhaust every argument as to why their particular work will not permit the use of a guard. In this connection I may say that it was remarked recently by one of our inspectors that if the manufacturers would exercise one-half the ingenuity in devising a means to use a guard that they showed in demonstrating why one could not be used, they would be rewarded by a material reduction in the number of their accidents. The third class, who are willing to pass responsibility, are the gentlemen who say that they will furnish the guards but that their help will not use them. Now, gentlemen, we have reached a point where we can at least tell our help what we want them to do and if they will not do what they should do, they can be replaced. This was not the case two years ago.

Why this Variation?

I have some figures here that I will quote as an illustration of how far accidents may be prevented in your plants if you want to prevent them. I have before me a list of six firms taken from the accident record of your Class last year. I do not want to quote the exact number of employees for fear you may recognise which one of you gentlemen present may be the one I am describing. I will just use numbers to describe the firms. For instance, No. 36, whose accident record was .049%. Firm No. 15, .09%, nearly double. You will notice the next number, No. 23 with .20%, which is 15% higher than the first one. Firm No. 48, 10%. I have some real information for you in the last two. Firm No. 9, 56%, which means an accident during the year of more than one-half as many employees as he has in the plant. But the last number is certainly worthy of your close attention, No. 85. His record is 250% and 75% of his accidents were saw accidents. Now if you will analyse this last firm's record you will find that he hurt every man in the plant twice during the year and he got half way through on the third crop.

The question that I want to ask you, gentlemen, is this. Is it reasonable that you should pay an assessment to the Workmen's Compensation fund to support a condition of this kind?

Now, some of the manufacturers who are aware that they are taking the proper precautions and who know that their accident expense is far less than their assessment, have reached a point where they are uneasy about this condition and the remedy for it is this. First, to push the Board for penalty under Section 74, Para. 4 of the Act, and, second, to have them establish a surcharge on assessment for any manufacturer who operates a circular saw without a guard and when I say, "when he operates without a guard," I mean whether the employer considers that the man who operates the saw and takes the position that his fingers are his own and that he can use the guard or not, as he sees fit, ought to relieve him of responsibility; but, whenever a saw is found in operation without a guard and reported, the manufacturer will be liable to the surcharge tax. I will be followed by Mr. Lovett, who will lay before you some of the particulars concerning these factory conditions with which he comes in contact.

Seek Co-operation of Manufacturer

I want to ask you if you are willing to get in line in respect to having the Board adopt the surcharge that I have described, or will you wait until the manufacturer who has a good record forces the issue? There are two or three outstanding causes for accidents that are helping to build up this tremendous assessment for workmen's compensation, which amounted to seven million dollars last year. It is up to us to do something to cut down and circular saws which are one of the leading causes for accidents among our industries.

He was followed by Mr. Lovett, Safety Inspector, who was formerly an inspector solely for the Furniture Industry. He spoke as follows:

Mr. Tobin has given you some statistics which, I am sure, were of interest to you all. I would just like to say a few words to you as to your part in this campaign. You, as managers and superintendents, are

responsible for the manner in which your various plants are operated. You pay close attention to cost and production, but when it comes to accident prevention you pass that one to some one else and, if accidents happen, blame the worker for being careless while you yourself are the most careless one of all in that you have not seen to, and insisted on every possible means being taken to eliminate accidents and make your plant safe. True, you have provided guards, but have you taken the trouble to see that they were suitable for the work in hand and that the workman used them properly? If you have not, then you have been very careless.

Insist on Precautions Being Taken

Figures were also presented on saw accidents, showing the saw to be the outstanding hazard in the wood-working industry, but gentlemen, if you will it, you can eliminate 75% of these accidents in two years. So often I go into a plant and find a man operating a saw with his guard six inches above the saw. I call the superintendent's attention to it and his reply is, "Well, there is the guard. What more can I do? If the man wants to take a chance, that is his business." He acknowledges right there that he is not boss, or that he is careless and indifferent to the safety of those in his charge. This applies to all machines, saws, jointers, shapers, etc. The guard is taken off or shoved to one side and nobody seems to care or notice it, until the inspector comes around and then the man gets the blame. In reality, it is simply lack of supervision. That is where your carelessness comes in again, in that you do not insist on your superintendents or foremen taking more interest in this phase of their work. No standard type of guard can be used for all the various operations on any machine, except perhaps the rip-saw or jointer, but that does not mean that guards cannot be provided for all operations. So many employers, because standard guards cannot be used, simply throw up their hands and say "It can't be done," forgetting that his own employees have brains and might devise a guard for any particular operation. Some of the wise ones have done this and their accident record shows the result.

Educating New Employees

Another feature that must receive your attention is the education of new employees. As a rule they are given a few rudimentary instructions and left to learn the rest from experience, which is costly to the firm and so often to the man himself. He receives a serious injury and is blamed for being a careless man when in reality, it is the supervisors who are careless in not showing the workmen how to work safely.

Mechanical guards will only prevent 25% of your accidents. The other 75% can be prevented by carefulness. See that good, practical guards are provided. See that they are properly and consistently used. Eliminate the chance-taker. Make your factory clean, bright and cheerful and invite the co-operation of your employees. Let them know that you are interested in their safety and welfare. Check up any accidents you may have and place the responsibility where it belongs, on the manager, superintendent, foreman or workman. Insist on every workman receiving first aid, no matter how slight the injury. Invite suggestions from your employees for ways and means of making your plant safe and you will get results that will be most gratifying.

Take Action Against Offenders

At the close of the above address it was moved and carried:

"That in view of the serious number of accidents occurring in some few industries associated with us in Class Three, which re-acts against the whole furniture industry, we, the members of the Furniture Manufacturers' Association, recommend to the Workmen's Compensation Board, the enforcement of clause four, section seventy-four, regarding special penalty against any such industries."

Do You Take Orders at Other Fellow's Price?

He May Know His Costs and Again He May be Guessing—Should be Greater Uniformity in Quotations—Increased Cost Knowledge of Untold Benefit to Industry

By Geo. H. Most*

Modern business can not tolerate unproductive or unprofitable departments or units, and accounting machinery that will reflect not only the loss but also indicate why and where it occurred is indispensable. In the millwork industry many instances have been brought to light through cost accounting where the lumber yard was returning a very satisfactory margin while the mill had been operating during its entire existence at a dead loss. We have also found that many mills failed to return properly to the investors because the profits realized in the machining department were nulified by the results obtained in the bench or cabinet and stair departments.

The elimination of loss is a rather perplexing problem for the millman. Unfortunately, in the past too many millwork producers were deluded by two common fallacies: (1) That they could always afford to take the bill at "the other fellow's price" and (2) that the estimate price was of rather secondary importance, because the deficiencies of the estimating department could largely be overcome by increased efficiency in the production department.

The first condition results almost directly from a realization on the part of the millman that he does not know the cost of his goods and feels, possibly, that rather than lose the sale he can afford to take a chance that his competitor has intelligently compiled his quotation. In the past, with the majority of millmen suffering from a lack of cost of knowledge, the accepting of a bill at the competitor's price simply meant the absorption of his shortcomings, and in many cases an accompanying loss.

The second instance outlined above is a fallacy indeed, for if sufficient of your product is sold at less than cost of production ultimate failure is in store, regardless of the efficiency of your factory or increased production. It is obvious, therefore, that the crux of the entire situation is knowing your cost so that your estimates may be based on actual cost, instead of on theory and guesswork. The sale price of millwork is merely a combination of the factors of cost and

*Address at Grand Rapids, Mich.

profit. If the cost is not intelligently arrived at, the average sale price will no doubt prove very unsatisfactory.

Elements That Determine Cost

Four factors enter into the cost of millwork; viz., material, waste, direct labor and overhead or burden.. Outside of the fact that a few mills still fail to realize that waste in cutting lumber ranges 10 per cent on southern pine to 40 per cent on white oak, almost everyone is quite familiar with cost, with the exception of the item of overhead or burden. This is by far the most elusive factor of cost, as both the compilation and application must be scientifically performed. In many industries this extremely vital problem must be met and disposed of by the individual operators. For many years the sash and door and millwork producers were similarly situated. Today, however, the subject of millwork cost is handled collectively through the institution which I represent—the Millwork Cost Information Bureau, of Chicago

Our association is the recognized authority on costs and estimating procedure in the millwork industry and in addition to supplying our membership with estimating cost schedules based on actual cost experience of our members, we have combined the meritorious features of all the cost systems existing in the past in member factories and have evolved the "Standard Cost Finding System."

Apportioning Overhead or Burden

Under this system the usual burdensome task of analysis incident to the termination of a period is eliminated by the arrangement of the ledger accounts, so that all expenses are properly classified, and the burdens are in reality compiled by a daily analysis effected by postings to properly subdivided expense accounts. At the end of the period the various expense totals are distributed against the proper burdens, so that a lumber burden per thousand feet is determined, also an hour burden for machines and benches, and a percentage of production cost for commercial burden. On account of the fact that both expensive and cheap material is to be considered, and that the nature of machine and bench work is diametrically opposite, it has been found advisable to divide the total overhead or burden into four parts, and also to apply each as a "unit of measure" wherever possible instead of on the percentage basis.

The foundation of each of the four burdens is the group of fixed expenses, including taxes, insurance, depreciation and interest on investment. These are prorated against the proper values in the various departments. The rates of depreciation used for machinery, buildings, autos, tools, etc., are those universally accepted by the best accounting practice.

Factors to Consider in Fixing Burden

Interest on investment is included as an item of cost in burden compilation but is not carried into the bookkeping as a regular item of expense, as a false profit would thus be created, which would prove to be misleading.

In addition to the fixed charges the lumber burden consists of handling expense, composed primarily of yard rent, repairs, labor, team and hauling labor and lumber purchasing expense. The kiln burden would be established in a similar manner, adding, of course, a part of power for heat.

Before it is possible to compile the machine and bench burdens it is necessary to arrive at a general factory overhead rate per hour. This overhead is merely used temporarily by the auditor in the compilation of machine and bench burdens, and consists of all items of expense not chargeable directly to either machines or benches, such as fixed charges applying to mill land, buildings and stock, also wages of foremen, watchmen, truckers, sweepers, superintendent and expense of stationery, time cards, water and light bills, etc. These expenses are totalled and charged against the machines and benches on the basis of direct hours worked in these departments. To this rate per hour is added an hourly rate, which will cover distinctly machine expenses. The total will equal the machine burden per hour.

The machine expenses referred to above would include—besides machine fixed expenses—a part of power, machine repairs, supplies, knives, oil, grease, etc. The bench burden is compiled just as is the machine burden; that is, the hourly rate covering bench expense is combined with the general factory overhead.

The commercial burden consists of all expense items exclusive of production costs: Warehousing, packing, delivery, office and selling. The expense items consist of fixed charges applying to warehouse and office property, also labor supplies, salaries, and items such as postage, telegraph, advertising, bad debts, etc.

Special Conditions May Create Other Burdens

For the average odd millwork factory, we recommend only these burdens enumerated above, but if conditions necessitate, other burdens may be developed to apply to each individual machine, or to departments considered as a unit. The question is often asked, why it is not possible to apply burden in one operation which will cover all expenses in the various departments. This procedure has been found to be very inaccurate and unsatisfactory; in fact, it constitutes a perilous procedure where the type of product and value of material are subject to wide variation. In reality, any system of burden application which fails to provide for an equitable distribution of overhead when products of a diversified nature are involved, defeats the real purpose of a cost system. It is necessary, therefore, to subdivide the total of overhead expense into a sufficient number of parts so that only a combination of such parts may be applied as is in reality required for the time under consideration. For instance, a burden of $50 a thousand on all material used would not be equitable for both machine and bench work, because, while machine work, such as molding, involves much material as compared to labor, the bench work or cupboards and stairs involves just the opposite proportion; that is, a very small amount of material as compared to the labor required. It is also obvious that the material required for an item bears only the slightest relation to the burden factor, so in general this plan is hardly feasible.

Why General System not Applicable

Another conspicuous example of improper burden application is to consider all overhead as being equal to 50 per cent of the material involved. In the event that a quantity of molding manufactured of southern pine were to be changed to mahogany, the burden would increase in the ratio about 1 to 3, according to the exact value of the material, whereas the running of mahogany molding would in reality occasion but very little extra expense.

A number of other methods of burden application

involving but one operation could also be cited, which are open to serious objections just as are previously mentioned. It is obvious, therefore, that not only the compilation but the application of overhead is of very serious import.

Before concluding, it may be well to dwell briefly on the necessity of cost work in general. In our industry, which, admittedly, is forced to contend with an extremely diversified and complicated manufactured product, we are peculiarly situated in that we are required to quote on the larger part of our output, sometimes months in advance of its manufacture. To compile a price on a complicated cupboard, stair or piece of panel work, that will be sufficiently low to secure the order and amply high to cover cost plus profit, is indeed a science. A thorough knowledge of construction and material is required, together with a well defined idea as to the probable amount of labor and overhead that will be consumed. Overhead has proved to be just about as large a factor of cost as direct labor. This being true, is it not a fact that burden should constitute a subject for discussion among executives equally as much as your wage scales and rates?

Wide Variations in Quotations

It has been proved in the past, that, primarily, through the lack of knowledge pertaining to material wastes and burdens, estimates on odd millwork have varied consistently between 20 and 300 per cent. A large part of the production of the industry was annually sold at considerably less than cost, with the natural result that an extremely large number of mills have found their investment to be in reality inferior to an investment in a first-class mortgage. The fact that at present over four hundred and fifty mills of various sizes, involving the major part of the industry, are associated in the interest of cost research and cost acccounting should furnish convincing proof as to importance of cost in this industry.

It is difficult to conceive of an enterprise so simple as can not be greatly benefited by knowing cost. To proceed without a knowledge of your cost is very similar to an attempt to erect a large building with an imaginary or unstable foundation. Our observations have proved that uniform cost finding methods are in many ways a distinct advantage to an industry. Each firm can then talk in common language and the efforts of all can be centralized.

I trust that those who have in the past disregarded their costs will give this important matter due consideration, and I know that once you have realized the tremendous advantages accruing from cost research, you will forever afterward be an ardent advocate of everyone knowing his costs.

D. R. Brewster Defines Good Kiln Drying

One Woodworker Lost $10,000 Annually by Not Being Up-to-Date—Features Necessary to Successful Drying—Operator Must Know His Work, Kiln and Wood

By D. R. Brewster*

Every woodworking plant naturally desires to bring its kiln drying practice up to a point where it will give maximum satisfaction and service. But kiln drying which is satisfactory at one plant, may be very unsatisfactory at another plant, which uses a different kind of wood or makes a different class of product. In other words, kiln drying requirements differ widely according to the species of wood to be dried, the thickness of the lumber, the grade of the lumber, the product to be manufactured, the number of different kinds of wood and the amount of each to be dried, the moisture condition before drying, the final moisture content desired, the permanency of the plant and many other factors. In order that you may know what constitutes good kiln drying at your plant, you must take all of these various factors into consideration and draw your own conclusion in the light of what I am going to tell you about good kiln drying in general.

The subject of kiln drying may be divided into two main divisions—first, the kiln, and second, its operation.

Each type of kiln has its friends and its uses. Every kiln company will give you a long line of "talking points" calculated to show how and why its particular kiln will give you best results and be best suited for your purpose. But when all of these points have been viewed in the light of common sense and particular experience, it will be found that there are only a few really necessary features in a good dry kiln and no one has a monopoly on any of them.

In the first place you need a building. This may be either brick, concrete, tile or wood, depending upon relative cost, permanency desired, fire risk allowed and amount of initial investment possible. For the permanent woodworking plant, probably a substantial fire proof building of brick and hollow tile will prove most satisfactory in the long run. Wooden kilns, on the other hand, have many good points in their favor, such as cheap and rapid construction, excellent insulating properties and portability. But no matter what material is used, any building will be satisfactory if it is tight and reasonably free from the influence of outside weather conditions. The building is, in fact, the least important factor in good kiln drying—any building with four walls and a roof can be converted into a good kiln at reasonable expense.

Having the building, you must provide some sort of heat. A great deal of lumber has been well dried in the past with nothing but warm air from a stove, or even an open fire. In the modern practice, however, this method does not recommend itself for drying expensive lumber, because of fire risk and difficulty of control. In the small shop good results are obtained by keeping stock in a warm corner near the ceiling, where it will gradually dry down to the proper condition. For most purposes, however, steam is much the most satisfactory form of heat, furnishing high temperatures with reliable and accurate means of control. Some kilns have steam pipes within the kiln while in other types the air is first heated by radiators outside the kiln and is then blown into the kiln and through the lumber by forced draft. Each method has its advantages under certain circumstances.

After heat, the next requirement for good kiln

*Address, Woodworkers' Club, Louisville, Ky.

drying is some means of introducing moisture into the air to prevent the outer surface of the wood from drying too rapidly so as to cause checking and case-hardening. This is sometimes done by evaporation from an open water surface or by spraying the air with water. But for ordinary requirements the most satisfactory method is to inject steam into the air in the kiln through perforated steam spray pipes.

The heated and moistened air must then be carried to the surface of the lumber to be dried so that the heat can do its work of evaporation. Evaporation of water consumes heat just as operating an automobile consumes gasoline, and the amount of drying that takes place is directly proportional to the amount of heat supplied to the lumber. To provide the heat required for rapid drying the heated air must be made to circulate freely between the boards.

There are two ways of obtaining this circulation—the natural draft and the forced draft. The natural draft takes advantage of the fact that heated air is lighter than cold air, and consequently rises, because of gravity. The lumber in natural draft kilns is therefore placed above the source of heat so as to be in the path of the rising heated air.

Forced draft kilns drive the heated air between the boards by some mechanical means such as a fan or blower or a high pressure spray of water. They usually also take advantage of the natural tendency of heated air to rise. It is necessary, however, to limit the velocity of circulation in forced draft kilns, as too high a velocity will dry the outer surface too rapidly, causing checking and casehardening.

Removing Moisture From Air

After the heated air has done its work of evaporation, it has lost some of its heat and picked up a corresponding amount of evaporated moisture. In an absolutely tight kiln this process would eventually increase the moisture in the air to a point where no more drying would take place. Consequently, some way must be available for removing the excess moisture before the air returns to the lumber. In the ventilated type of kiln this is done by removing some of the moist air through openings or stacks and replacing it with fresh air from the outside. In what are known as "re-circulating kilns," moisture is condensed out of the air like dew, either by cold water pipes, cold water sprays or canvas curtains where the air outside of the curtain is colder and drier than that inside the curtain. In the ordinary kiln the cold air which enters through cracks and holes around the door is more than enough to provide for removing the excess moisture, and the common problem is to add moisture to the kiln air rather than to remove it.

More or less casehardening will usually develop in spite of precautions. It can be relieved by softening the outer surfaces of the boards with hot, moist air. This is done by injecting a large amount of steam into the kiln for a few hours up to the point where the wood absorbs moisture or even until the air is saturated. Either live or exhaust steam will serve this purpose, but live high-pressure steam injected through an open steam pipe gives the quickest and most satisfactory results.

Having first the building, second, the heat, third, the means of moistening the air and steaming the lumber, fourth, the circulation of air, and fifth, the provision for removing excess moisture, the kiln is complete, and only requires intelligent operation for good results.

Proper Piling is Indispensable

Proper piling of the lumber is the first requirement of correct kiln operation. A level and solid foundation is necessary and enough stickers should be used to prevent sagging and warping and support the ends of the boards. The stickers should be of uniform thickness and placed one on top of another in straight vertical rows. It is also very important to place the lumber in the kiln in such a position that the air can circulate freely between the boards without interference from the stickers. That is, if circulation is crosswise of the kiln the lumber should be flat piled lengthwise of the kiln. Openings between the boards or chimneys in the interior of each truck load should also be provided to allow the heated air to rise upward through the lumber.

Temperature control is the second essential of good kiln operation. Some woods will safely stand much higher temperatures than other woods. For certain uses, such as in airplanes, where maximum strength is required, temperatures must be limited to not higher than 135 or 145 degrees Fahrenheit. For table tops, the same woods might be satisfactorily dried at temperatures as high as 180 degrees Fahrenheit, or more. Temperatures must be varied also to suit the moisture in the wood. With green wood much lower temperatures are necessary than with wood that is nearly dry. Most satisfactory temperature control is obtained by thermostatic valves placed on steam heating pipes. With close attention on the part of the operator, however, good results can often be obtained by hand-operated check valves and pressure-reducing valves.

The moisture or humidity of the air must also be under control in order to obtain most rapid drying and at the same time avoid checking, casehardening and honeycombing. Such humidity control is best obtained in the ordinary kiln with a thermostatic valve on the steam spray line operated by a wet wick. It may also be obtained by a hand-operated steam spray valve or by varying the temperature of the water used in water sprays or condensing pipes.

Make Frequent Tests

Since the temperatures and humidities to be used will vary with the amount of moisture in the lumber, good operation requires tests, to determine what the per cent. of moisture is, both at the beginning of the drying and at intervals during the drying until the lumber is fully dry. Such tests are made by weighing sections cut several inches from the exposed end of the board, then dry the sections until no further loss of weight occurs and then dividing the amount of loss by the final weight to get the percentage. These moisture tests must in many cases show not only the average moisture, but also the amount in the centre of the boards as compared with the outside. Too great a difference is a danger signal indicating the development of casehardening and of honeycombing. Many moisture tests are incorrect, because the test sections are cut too thin or are not dried long enough or are dried at too high a temperature. Accurate tests can be made with test sections not less than ½-inch thick in direction of the grain dried for not less than 24 hours, with temperatures not above 220 degrees Fahrenheit. Careful testing requires a balance with a capacity of 200-300 grams sensitive to 1/20th gram.

In order to know when to soften the lumber by steaming when casehardening develops, tests for casehardening are also necessary at certain critical stages of the drying. Such tests are simple and can be easily made by resawing into three-eighth inch strips a ¾-inch section cut from the interior of a board. If the outer prongs or strips pinch inward severely a seriously casehardened condition is indicated.

Both moisture and casehardening tests are most necessary when trying out new kilns or when drying a new species or thickness of lumber. As the operator becomes familiar with the kiln and kind of lumber concerned, he can gradually eliminate much of the testing which was necessary at first.

Relies on Experience

But to reduce the amount of testing safely and intelligently, the operator must keep careful, adequate and permanent record of his kiln operations. These records should include first, a description of each kiln charge, giving the amount, kind and thickness of lumber, where it came from and how it had been handled before it reached the kiln. Then, for each kiln run, accurate thermometer readings should be taken once or twice a day or oftener, showing the temperatures and humidities of the air, particularly at the hottest and driest point in the kiln. In formation on manipulation of valves and ventilators and other control apparatus should be recorded along with temperature and humidity readings. A record of the results of all moisture and casehardening tests should also be kept, together with the temperature and duration of steaming treatments given to relieve casehardening. Records of this kind will provide the basis for intelligent improvements in kiln operation and are very essential, if maximum results are to be obtained.

In addition to keeping adequate records, the operator must also constantly study his kilns, looking for ways to improve results and reduce drying time. The efficiency of any kiln is measured by the uniformity of the drying. No matter how rapidly the lumber may dry at one point, the charge cannot be removed until all parts are dry. Consequently, the entire charge may be held up by some slow-drying portion in a part of the kiln where circulation is sluggish or temperature and humidity conditions are not right. These slow-drying points must be discovered by means of smoke tests showing the direction of air circulation and by moisture tests of the lumber in different parts of each kiln. Uneven drying must be corrected by necessary alterations in the design or equipment of the kiln before satisfactory results can be obtained.

After considerable experience in inspection work, I have come to the conclusion that all kiln-drying operations can be classified into three groups.

Fool Proof Class

The first group I will call the "Fool Proof Class." This class seeks refuge from the bother of the kiln-drying problem by working out a method which will practically take care of itself with a minimum of attention, small direct expenditure, and low-priced, unskilled labor. Simplicity is the watchword of this class. They look at the drying of lumber as they would look at the drying of the weekly wash on Monday morning in the back yard—an essentially simple operation, not deserving of any particular attention of thought.

This class got along with air-dried lumber as long as they could. When they finally became convinced that kiln drying produced a better product, they installed the kiln which promised to do the work with the least amount of direct expense and attention. The simpler the process, the better it suited them. They wanted their kilns "foolproof"—so simple that any yard hand could operate them, and so nearly automatic that the operation consisted merely of putting lumber into the kiln, turning on the steam and taking the lumber out again. Since this class has always neglected the drying operation and the whole matter of moisture in wood, they have not in many cases realized the large indirect losses which often result from this simple foolproof process and have therefore been fairly well satisfied with the results obtained.

Example of "Foolproofing"

Not long ago, I visited a furniture plant which is a typical example of the foolproof class of kiln operations. The plant was built some 40 years ago on the outskirts of a town which has now grown to be a city for miles beyond. A large yard area was provided for air-seasoning and it has always been the practice of this plant to leave all stock in the yard on sticks for six months to a year before going into the kilns. Progressive kilns were built 25 years ago, sufficient to hold a month's supply of lumber with the plant running at maximum capacity. A limted heating surface was provided sufficient to give a maximum temperature of about 135 degrees in the kilns.

The method of operation at this plant was simplicity itself. The lumber was never more than 2 inches thick, and mostly 1 inch. After being first air-dried at the mill and then air-dried six months or more in the yard, it was always dried down ot a uniform moisture content of from 12 to 15 per cent., when it was placed in the kiln. The door was then closed and the heat turned on. With such a low moisture content and such low temperatures, most species of lumber may be kiln dried without much damage, in almost any kind of a hot box or heated building. The stock at this plant was consequently in fairly good condition when taken out at the end of a month or six weeks in the kilns. It was always fully dried and ready for use when needed, since it had been left in accomplish the drying.

I have never visited a plant where the ideal of simplicity and fool-proofness of kiln operation was more nearly attained than at this furniture factory. Yard hands loaded and unloaded the kilns; the engineer turned the steam on and off; the shop got the stock when it was needed. No moisture tests were necessary, no casehardening tests, no steaming treatments to relieve casehardening, no high-priced, trained operator. The kilns practically ran themselves and produced results which satisfied the plant.

Unnecessary Annual Cost $10,000

This system has its advantages, I will admit, yet it also has a very great fault—a fault that is almost universally overlooked by the advocates of such foolproof kiln drying. That fault is unnecessary cost. Let us take this same plant as an example.

In the first place, preliminary yard drying for from six months to a year required the carrying of from 500,000 to 700,000 feet of lumber ahead at all times over and above the amount needed to provide a reasonable reserve against delays in shipment.

This stock was piled on valuable land in the industrial district and it is estimated that the value of the excess stock of lumber and piling space would aver-

age at least $30,000 over the last ten years. Interest, taxes, insurance and depreciation would at least be 8 per cent., or $2,400 yearly. In addition, there would be an extra charge for piling about 1,000,000 feet of lumber each year, which even at pre-war prices would amount to at least 60 cents per thousand, or $600 more.

Now, coming to the kilns, we find that the kiln space provided is more than twice the amount really needed. We will forget the double investment in land and buildings and consider only the loss from the heating and operation of double the kiln space required. The costs of kiln operation were never kept s parate at this plant, so we can only estimate. We do know, however, that with pre-war costs of coal and labor, a representative cost for kiln-drying one inch air-dry lumber was five dollars per thousand, exclusive of handling charges. By leaving the lumber in the kiln two or three times longer than necessary, it seems fair to assume that it cost this plant an additional $5 per thousand, or $5,000 a year in kiln operating costs.

Now take the stock as it comes from the kiln when dried in this fool-proof way. It is invariably casehardened to some extent, even when thoroughly air-dried before kiln-drying. In the furniture plant, this casehardened condition causes loss all through the machining and finishing processes, and even after finished goods are sold and put in service, from twisting, warping, surface-checking, opening of glue joints and shrinkage. Losses from this source have been known to amount, in some cases, to from 10 to 20 per cent. of the original rough lumber. Not only the material is lost or has to be reworked or patched, but also much of the labor expended on it is also wasted. In a plant of this size, the factory loss from casehardening can safely be assumed to have been at least $2,000 per year.

Summing up then, we have in the yard, kilns and factory an average total amount of more than $10,000 per year, which it has cost this plant in conducting its seasoning on the fool-proof plan. This amount would have been sufficient to thoroughly remodel the old out-of-date kilns, pay a competent operator to look after the kilns and still have a handsome surplus at the end of each year.

(Continued in April issue)

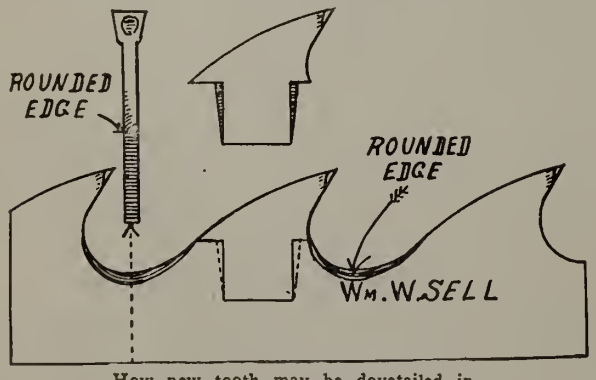
Replacing Broken Teeth in a Resaw Blade

Advisable to Attach New Teeth Rather Than Cut Saw or Operate with Teeth Missing--Two Methods Often Followed

By Saw Filer.

One or a number of teeth are often knocked out of a band resaw or band mill blade, owing to striking such items as bits of rock, spikes, and pieces of iron or steel, embedded in the wood. When this happens some filers cut out the missing teeth, brazing the ends together or, in some instances, brazing a short length of blade, others chip down and retooth the blade. The newer method is to braze in new teeth. This can be done in several ways.

Brazing in new teeth was discussed by several filers, in a recent issue of the "North American Filer." One writer maintained that no matter how perfect a braze might be made, it was bad practice to cut the saw and rebraze. His method of fitting new teeth is illustrated in the accompanying sketch. By a little



How new tooth may be dovetailed in.

study of same one can readily see the advantage of perfectly repairing a few teeth so that there is no danger of accident in the grinder, so that smooth lumber will result.

Dovetailing New Teeth

First prepare your laps in the stub teeth, being governed by the spacing as how much surface to allow for brazing. The illustration is one and five-eighths spacing. On a two-inch spacing one can have a much wider lap but not any deeper. If the depth is greater, it merely is an invitation for a crack alongside the dove-tail and also the longer time to wear the tooth out into good steel. Take particular notice to prepare the shoulder on each side of the lap on stub tooth for strength and to fit the tooth over this so that when it is finished it will be smooth and a full tooth.

After the tooth is brazed and the tension re-adjusted so that there is no danger of a fracture in this place, it can be placed in the grinder and finished the usual way. Swage these teeth and then always keep them filed down about one-thirty-second of an inch. This will protect them from heavy work and knots. After this is all finished and the saw ready for the wheels, take a half-round file and file out the throats of the brazed teeth, like illustration, on the outside of saw. This will protect the throats from fracture. The writer uses this method also on the braze throat and the tooth on each side, with the result that very few brazes are made.

With a little practice one can put these teeth in quickly and so they cannot be found. If one feels a little afraid to try it the first time in a saw, take a piece of plate a foot long and cut out a couple of teeth and fit and braze in new ones. They will stick.

Prefers Oxy-acetylene Weld

Another filer who has been conducting a few experiments with a view to finding the best method of salvaging and repairing oxy-acetylene blow torch. A short time ago a 14-gauge double-cutting saw was driven into a railroad spike and came out with 35 teeth broken off close to the blade. These teeth covered a continuous space of about five feet on the saw. Teeth were taken from an old saw and welded with an oxy-acetylene blow torch to the stubs, which had previously been straightened. Former experiments had shown that teeth welded in this manner were liable to prove brittle and more apt to break than

original teeth in a new saw, so to overcome this and make the teeth stronger and more pliable, a pair of blacksmith tongs were heated red hot and clamped to each tooth separately. Tongs and teeth were allowed to cool gradually while clamped together, thus annealing both tooth and weld. With a little filing on the welds, teeth were true enough for the "gummer" to put in perfect size and shape. This saw has been run at least six times since being repaired and so far no defects have developed. It is almost impossible to detect where the new teeth have been inserted.

Broken teeth have been successfully replaced in 16-gauge saws, usually four or five in a saw. In one instance 28 new teeth scattered over the entire length of a 34-foot saw were inserted, and every tooth, after several months of wear, is still perfect. Many times teeth have been built up one-fourth of an inch with nickle steel and an acetylene torch. These swage and wear just as perfectly as original teeth.

Works Out to Good Advantage

These experiments have been distinctly worth while. Without this process, where a number of teeth were broken off, the saw would have to be clipped down and retoothed, leaving only about 1 1-3 inches of wear in a new double-cutting saw. Electric welding has been tried, but heat can be controlled more perfectly with an acetylene torch. Saws will occasionally crack near the cutting edge and experiments are being made to sew these cracks and anneal them with a torch.

In a large plant operating, say, four double-cut band saws and two horizontal resaws, each carrying a working equipment of 12 saws for 20-hour shifts, the upkeep, repairs and renewals is a big item, the renewals alone costing approximately $1,500.00 each month. With these new repair methods, the life-time of the saw is lengthened, and each saw actually wears down until too narrow for the wheel before going to the junk pile. As long as a saw is wide enough to run, all breakages are repaired and each saw runs as true and cuts as perfectly as when it first leaves the factory.

In a short time a complete welding outfit will be installed in all filing rooms and become a necessary part of the filing equipment, thus reducing the upkeep and saw expenditures very materially.

The Electric Drill and Screw Driver as Means to Greater Production

By H. B. Beattie

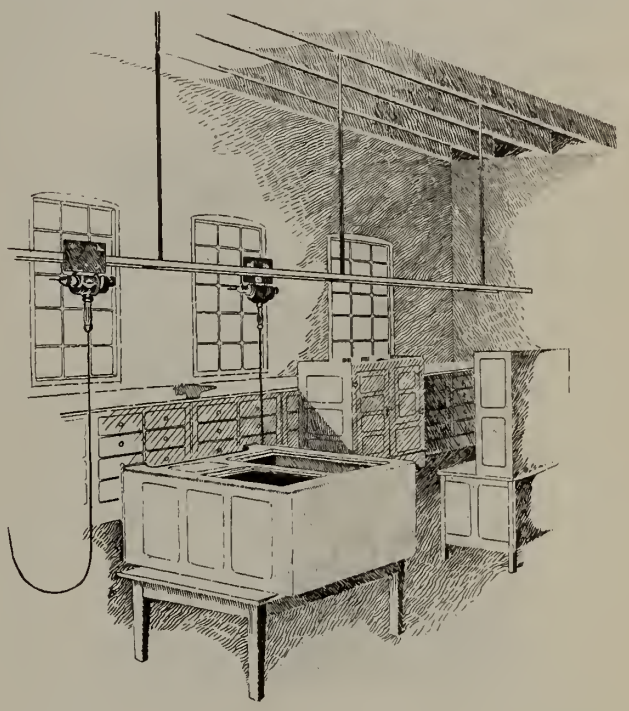
The accompanying illustration shows an installment of the above tools in the trimming room of a plant where refrigerators and kitchen cabinets are the main products.

The tracks on which the hangers that hold the tools travel are suspended from the ceiling, the supporting pieces being of ½ in. piping, the track itself is of flat iron 1¼ in. x ¼ in., the upright supports being placed 7 ft. apart.

The plate on which the wheels are fastened is 8 in. x 5 in. x ¼ in. There are three wheels, two on the top and one below; the top wheels are grooved on the rim to fit the ¼ in. track, the lower wheel is flat on the edge and is merely to keep the top wheels from jumping off the track, it being set sufficiently close to the lower edge of same.

This carriage will have to be shoved on to the track from the end. Through the ends of the track a pin is put which prevents the running off of the carriage. The outside face of the carriage plate is provided with two iron hooks that are rivetted to the plate, these conform to the shape of the electric tool and hold it securely when not in use. The track is made so as to be nicely clear of a tall person and the tool can be easily reached when needed.

The ease with which the carriage runs along the track makes it readily accessible and as the handle of the tool hangs down it is easily reached. The slack



Efficient installation for electric drills and screw drivers.

in the electric cord can be taken care of by a small counter weight attached to a cord that runs over on a hollow faced pulley, which is tied at proper place to suit requirements.

This installation is a great time-saver in the trimming of such goods, as the screw holes can be bored very quickly, the operator holds the hinge by one hand and the drill with the other, and soon becomes expert at it. The screw driver is almost equally as useful in this work, though it plays a more useful part when it comes to driving heavier screws, as the ordinary spiral quick return hand screw driver is very hard to beat when it comes to small screws.

The foregoing may suggest to some readers of the "Canadian Woodworker" how they might effect economies in some departments of their plants. The tools mentioned above are made by the Thor Electric Company, whose agents are the Garlock-Walker Machinery Limited, of Toronto.

Better Shipping Cases for Phonographs

At a meeting of the Canadian Phonograph Manufacturers' Association, held in Toronto recently, a number of complaints were made as to the quality of the shipping boxes the members of the trade were receiving. The suggestion was made that it might be a good idea to pool the buying of the Association members and purchase the shipping cases from one source. In that way the members would be in a position to demand a satisfactory box. No definite action was taken on this point.

Disposes of Interests

Major J. E. L. Streight of Islintgon, Ont., who recently sold his woodworking factory and lumber yard to the Irvin Lumber Co. of West Toronto, is widely known in the industry. He has had an interesting career in military circles and took part in the South African war, in which country he remained for some years after the close of hostilities. He returned to Canada in 1908 and started in the lumber business at Islington. When the world-war broke out in 1914, he promtply enlisted and commanded the first 250 men to leave Toronto, departing in charge of the contingent on August 14th, 1914. He took part in several engage-

Major J. E. L. Streight, Islington, Ont.

ments and was wounded and taken prisoner at St. Julien on April 24th, 1915. The Major was a prisoner of war for three years when he was exchanged and returned to Canada. He has spoken before a number of representative gatherings, outlining his experience and describing some of his thrilling attempts to escape, and the hardships and cruelties endured during the time that he was in the hands of the Germans. Arriving in Canada in August 1918, Major Streight re-opened his lumber yard on a new site with railway track facilities and also erected a planing mill, which is well equipped. Major Sreight will enjoy a rest for the present.

Expect Good Summer Trade

Chappell's Limited, of Sydney, N.S., who are widely-known lumbermen, woodworkers and builders, having sawmills at Sydney River and Oxford, N.S., say that the past year was the best they have had since they have been in business. The outlook for the present year is rather uncertain. They think that demand will be slow till after May 1st and that the year will close, showing a good average, at least during the last six months.

Continuing, the firm say "A decrease in wages of 20 per cent. has been put into effect in the Dominion Iron & Steel Co., and the smaller manufacturers are considering reduction of from 10 to 15 per cent. The housing situation is not ideal but is not as acute as it will be when business opens up in the spring.

"We understand the lumber output in Nova Scotia and New Brunswick is generally lighter than in past years, and we also notice that many lumbermen are offering to sell parts of their cuts at prices lower than those which prevailed last season, during which time many small operators held for the speculation, which is not now so much in evidence.

"In conclusion, we would say that the outlook for the next few months is only fair but the prospects are good for the balance of the year."

Size Not Deciding Factor

Small plants as well as large ones can be efficiently equipped and systematized. One small woodworking operation which consisted of but three machines, had a modern Yates high speed matcher, a Yates power feed rip saw and a Yates band saw. The line shaft which was about 40 feet long, was equipped with ball bearing hangers and the whole was driven by a 35 h.p. ball bearing motor. This is what might be termed an "efficient installation," for not only did the equipment consist of modern high production machines but the transmission was such that many dollars were saved in the monthly power bill.

Changes in Hardwood Inspectors

H. F. Holton, Toronto, was recently appointed inspector of the National Hardwood Lumber Association for Toronto and district. He has been with the association for more than a year and previous to that was engaged with Hart & McDonagh, whole-

H. F. Holton, New Inspector, Toronto district, N.H.L.A.

sale lumber merchants, Toronto. Mr. Holton was born and raised in Ontario. It is understood that J. E. Banks, late inspector of the N.H.L.A., has gone to Buffalo, where his home is and where he intends taking a position. H. H. Hastings will be Mr. Holton's assistant in the hardwood inspection work in the Ontario district.

Work as if you owned the place—and perhaps you may.

Never mind if competitors do tread on your heels as long as you keep them behind you.

Calculating Lumber Contents of Box

Uniform Method of Value to Industry—Money Lost Through Not Allowing for Waste—Rules Adopted by West Coast Box Men

By D. H. Stearns

The February "Canadian Woodworker" contained an interesting article, submitted by L. J. Conway of the Canada Box & Lumber Co., Quebec, outlining the method employed by his organization in figuring the feetage in boxes. This is a very timely topic—one that should have the attention of all box manufacturers. If some uniform system or method of figuring the lumber content of a box or set of shooks were adopted by the Canadian industry, it would tend for greater uniformity in quotations and would also eliminate the losses which occur in certain plants due to careless and totally inadequate methods of figuring feetage.

If, when figuring costs or preparing a quotation, a box man does not make due allowance for all cutting and manufacturing wastes which occur in converting the stock to the desired length, width and thickness, he stands a good chance of quoting too low; depending entirely on the amount of error in his calculations and the spread of profit he figured. There are more wastes than the actual loss due to trimming to the different lengths. Every time a piece is ripped or resawn a certain quantity of lumber goes into the sawdust pile. All possible losses must be figured out and allowed for, if accuracy in estimating is to be obtained.

Another advantage accruing from uniformity in calculating feetage, is that after certain standard methods have been worked out and adopted, it might be found that such figures may not be applicable to all plants. Some box men might not, for instance, be able to cut three ¼" pieces from 4/4 material or two pieces ½, S2S. from 5/4 stock. That should lead them to infer that their methods or equipment is not what it should be, and to successfully compete with their more up-to-date competitors, they will be compelled to improve their methods or equipment and thus the efficiency of the whole industry would be improved.

The following rules for figuring feetage were adopted by the box section of the West Coast Lumbermen's Association at a convention held in Seattle a short while ago and are presented in the hope that they will prove of interest and perhaps contain information which may be of value to the Canadian box industry:

Lengths

No fractions less than quarters to be figured. Where a dimension contains such fractions, use next quarter above.

Thickness—Rough and S1S

3/16 RS, 3 pieces from 4/4, center pc. resawn surf.
¼ Scant, 3 pieces from 4/4 R/S, center pc. resawn surf.
¼ S1S, 3 pieces from 5/4 R/S, center pc. resawn surf.
5/16 Scant, 3 pieces from 5/4 R/S, center pc. resawn surface.
5/16 S1S, 2 pieces from 4/4.
⅜ S1S. 2 pieces from 4/4.
7/16 S1S, 2 pieces from 5/4.
7/16 Rgh., 2 pieces from 5/4.
½ S1S, 2 pieces from 5/4.
½ Rgh., 2 pieces from 5/4.
⅝ S1S, 2 pieces from 6/4.
⅝ Rgh., 2 pieces from 6/4.
11/16 Rgh., 2 pieces from 6/4.
¾, 3/16 and ⅞ S1S of S2S, 1 pc. from 4/4.

Thickness—S2S

3/16 S2S, 2 pieces from 4/4.
¼ S2S, 2 pieces from 4/4.
5/16 S2S, 2 pieces from 4/4.
⅜ S2S, 2 pieces from 5/4.
7/16 S2S, 2 pieces from 5/4.
½ S2S, 2 pieces from 6/4.
5/6 S2S, 1 piece from 4/4.
11/16 S2S, 1 piece from 4/4.

Widths

¼ and ⅞ as 1".
1" to 1½" as 1½".
1⅝" to 1⅞" as 2".
2" to 2¾" as 3".
2⅞" to 3¾" as 4".
3⅞" to 4¾" as 5".
4⅞" to 5¾" as 6".
5⅞" to 7¾" as 8".
7⅞" to 9¾" as 10".
9⅞" to 11½" as 12".
11⅝" to 13½" as 14".
15⅝" to 15½" as 16".

In case of two or more pieces to a part, same rule to apply as one piece; i.e., the width of each piece of lumber used shall be figured as above.

One piece parts under six inches shall be figured to the next full inch above; except that, when the fraction shall be over ¾", the width then to be figured the next full inch.

On parts 6 inches to 11 ½ inches wide, the same rule to apply; except only even widths shall be figured, i.e., 8-inch, 10-inch, 12-inch.

On wider than 11½ inches. the same rule to apply; except the fractional dividing point shall be the ½ inch instead of ¾ inch.

To be figured as to length and thickness the same. as shook. As to width they shall be figured as follows:

Everything up to one inch in width shall be figured as one inch wide.

Anything over one inch and up to 1½ inches shall be figured as 1½ inches wide.

Anything over 1½ inches and up to two inches shall be figured as two inches wide.

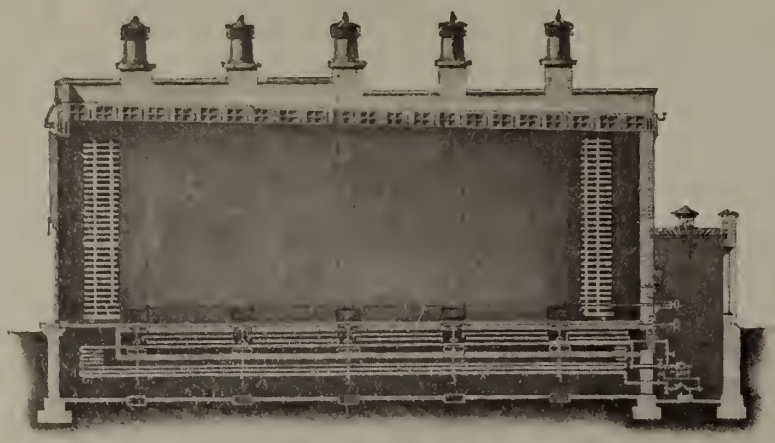
Anything over two inches wide to be figured the same as shook.

Weights

Usual run of shook, including resawn stock, 2,000 pounds per M feet. If cheap grade crate stock, or not thoroughly dried stock, 2,000 to 2.200 pounds.

Decimals

In figuring the total feetage of a box, the third decimal shall be dropped whenever it is less than 5/1000, and when it is 5/1000 or over it shall be called 1/1000 and added accordingly.



Thermo-Myst dry kiln as manufactured by Curtis, Hosey Dryer Co., Philadelphia, Pa.

Dry Kiln Co. Open Canadian Office

The Curtis Hosey Dryer Co., Philadelphia, Pa., manufacturers of the Thermo-Myst system of lumber drying, have recently made application at Ottawa for patents and trade make registration, and have also opened an office at 177-179 Duke Street, Montreal, P.Q., under the name of Curtis Hosey Company of Canada. They state they are now in a position to offer their Thermo-Myst lumber dryers to the Canadian trade.

The Thermo-Myst lumber dryer is a product which was placed on the market in the States about one year ago, and a number of successful installations have been made for wood working industries in the States. The Curtis Hosey Co. claim that this system of drying has numerous improvements, such as complete automatic temperature and humidity control, also a system of recirculation and a heating and humidifying system that insures even distribution of the heat and humidity in the lumber dryer, also that it produces uniform drying, eliminates warping, checking and honey-combing, and produces positive and rapid results as well as economy in the operation.

The Canadian branch will be in charge of R. MacLeay, managing engineer. Mr. MacLeay is well qualified to handle all problems relating to lumber drying, having had long experience in industrial engineering, and is an expert in heating and ventilating problems. He is a native of Canada, and the Curtis Hosey Dryer Co. of Canada take pleasure, in placing at the disposal of the Canadian woodworking trade, the facilities of their engineering service department which they maintain in connection with their Montreal office. They will be pleased to co-operate in solving any difficulties in drying problems with which the trade may have to contend.

Complete facilities have been planned for the manufacturing in Canada of all mechanical equipment that enters into the construction of the Thermo-Myst lumber dryer, with the exception of a few special parts, thereby saving their Canadian customers the expense of duties, freight and exchange that would accrue if this equipment had to be imported from the States.

A cutter that has got the "blues" soon turns its edge up, gets blunt, and requires a lot of attention.

How Moisture Affects Strength of Boxes

Of two boxes made exactly alike from the same grade and thickness of lumber, one may stand ten times as much rough handling as the other, because of a difference in the moisture content of the lumber or a difference in subsequent storage conditions. Tests made at the Forest Products Laboratory, Madison, Wisconsin, show that only when a box is to be used for a very short time immediately after manufacture is the proper seasoning of the lumber unimportant.

Within a week after manufacture a box made of green lumber suffers a marked reduction in strength. As the wood dries, the nails lose their grip. The fibers which are bent down along the nail shrink away from it in the direction of the end grain, the direction in which it was most firmly held, leaving the nail held only by two sides. Under such circumstances the weaving action during transportation alone will readily cause the nails to work loose and even come out of the box. Boxes made of green lumber at the laboratory and kept for a year in dry storage tested only about one-sixth as strong as similarly-made boxes tested at the time of manufacture.

If a box is made of dry wood and then subjected to alternate wettings and dryings, through cold storage or exposure to weather, the nails will be loosened just the same as in green lumber. Boxes made up from dry lumber were kept for two weeks in damp storage and then for two weeks in dry storage. After this treatment the boxes withstood only one tenth as much round handling as those made of air-dry lumber which had not been subjected to adverse storage conditions.

A box of lumber in the proper moisture condition will stand ordinary storage without any appreciable loss in the holding power of the nails. The best results are, therefore, obtained when the lumber is seasoned in accordance with the atmospheric conditions which the box will encounter in service. If it is impossible to forecast these conditions, it is advisable to use thoroughly air-dry lumber, which contains from 12 to 15 per cent moisture.

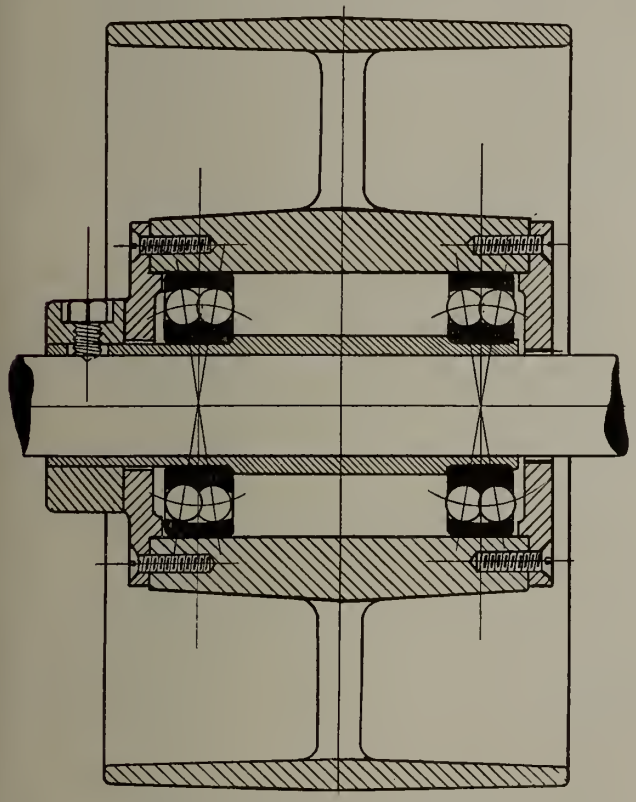
Accidents are the fault of some. Don't let the fault be yours.

You increase the chance of breaking emery wheel by running it too fast.

Machinery & Equipment

Ball-bearing Loose Pulleys

One of the newer developments of the application of ball-bearings to loose pulleys is shown in the accompanying sketch. The radial bearings are mounted on a steel sleeve, which is held to the shaft by a set collar and which is used to locate the pulley in position on the shaft. This design, which is simple in construction, gives a very large chamber between the bearings for the lubricant, with the result that one filling should, under ordinary conditions, last for one or two years. The end covers keep out the dirt and prevent the escape of the lubricant. With this type of loose pulley, the centrifugal action of the pulley carries the grease or oil to the inside of the hub where it is required rather than away from the bearing,

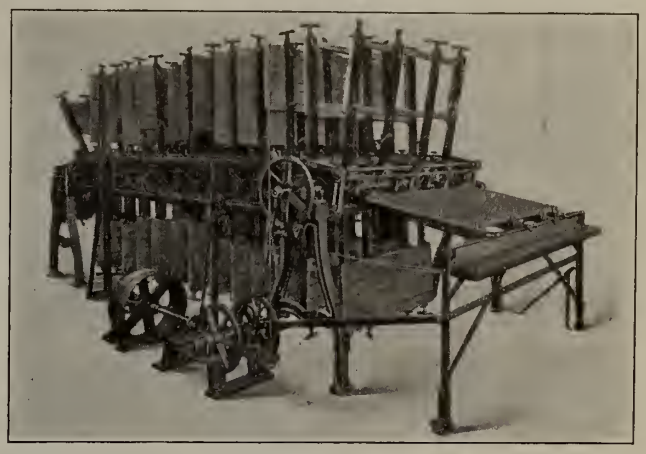


Ballbearing application for loose pulleys.

which is the case in the ordinary type of pulley with plain bearing. Owing to the high speed at which the loose pulleys on woodworking equipment are usually run, an application of this type is particularly advantageous. For further particulars write to the Canadian S. K. F. Co., Limited, 83 King St. West, Toronto.

Billstrom Clamp Carrier

There are many types of clamp carriers on the market. The one herewith illustrated is the well-known Billstrom clamp manufactured by N. J. Billstrom, Rockford, Ill. This clamp is made in two sizes with either 29 or 39 sections. The clamps are adjustable for stock up to 6 feet, 6 inches in length and 30 inches wide. Special sizes having a larger capacity are made to order. This machine requires a floor space 19 feet long and 9 feet wide for the smaller machine and 24 feet for the 39 section size. It is



Space and labor saving clamp carrier.

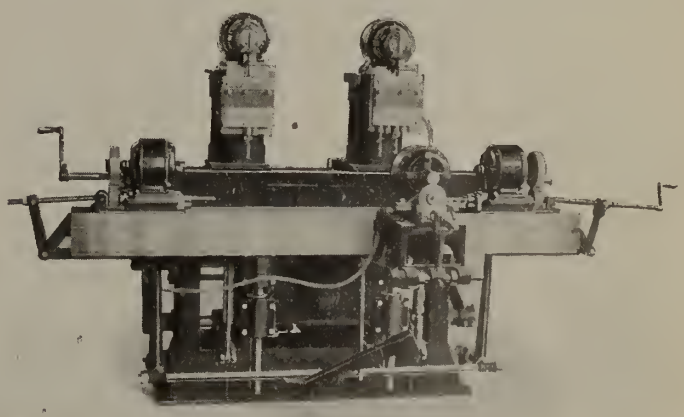
power-driven and can be belted from almost any direction. The movement of the carriers is controlled by the operator by levers which are placed within easy reach. With this type of clamp the adjustable clamp is pulled toward the stationery head which tends to prevent the stock from buckling.

Clamp carriers are being used by many woodworkers to cut their glue-room costs. Circulars and full particulars on application to Nels J. Billstrom, 202 9th St., Rockford, Ill.

Four-way Boring Machine

This machine, from the shop of the Dauber-Bell Machine Co., Oshkosh, Wis., is adapted for boring in one, two, three, or four directions at once. It is entirely motor-driven, there being a motor for each bit-carriage and one for the table-lift.

The work-table at the front of machine is power-



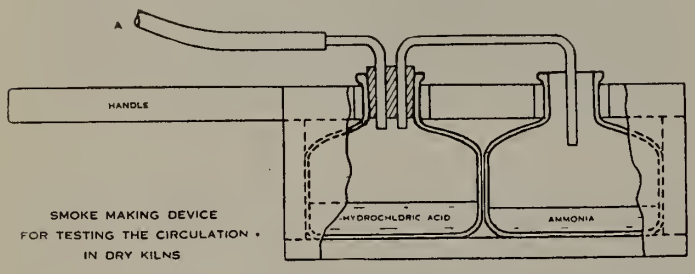
Dauber-Bell four way boring machine.

driven, and, as it rises and falls, the end carriages and side carriages are moved in and out of the work automatically. As the table rises the work rises with it, and can be bored in both ends and two sides at once. Bit-carriages are all adjustable to bore various depths and for work of various lengths. Bits are ordinarily furnished on 1-in. centers, but can be furnished on various centres, to suit requirements. Further particulars may be had on application to the manufacturers.

Testing the Circulation in Kilns

Watching smoke travel through the piles of lumber is the best method of testing the circulation in a dry kiln. The smoke may be made by burning punk-sticks, tobacco, or rope. Some fire risk, however, attends the use of any of these. Furthermore, the smoke has a temperature higher than that of the air in the kiln and tends to rise of its own accord before following the air currents.

A device which produces a fireless chemical smoke is used for testing circulation in the kilns at the Forest Products Laboratory, Madison, Wisconsin. This device is easily made by anyone and requires only the



Device for making cold chemical smoke.

following materials: some short, thin pieces of board; 2 small, wide-mouthed bottles,—ink will do; 3 feet of 3/16 inch rubber tubing; 6 inches of ⅛-inch glass tubing; a two-hole rubber stopper to fit one of the bottles; some concentrated ammonium hydroxide and some hydrochloric acid. The accompanying sketch suggests how the apparatus may be constructed.

To use the apparatus, pour a small amount of the chemicals into the bottles as shown. Blowing through the tube A will cause a dense white smoke to issue from the bottle containing ammonia. This device may be carried into a kiln without danger of fire, and the smoke will be found to follow air currents without any tendency of its own to rise or fall.

Lathe for Turning Spars

One of the largest woodworking lathes ever produced is shown herewith. This machine was made by the Oliver Machinery Co. of Grand Rapids, Mich., for the U. S. Government. It is to be used for turning spars or ships' masts. The bed is 62 ft. long and the heads have a swing of 32 in. It is equipped with two power-feeding carriages, together with a number of steady rests for supporting the long spars while they are being turned. An idea of the length of this lathe may be gained from the fact that it is equal to 44 men standing side by side. Only two manufacturers of woodworking equipment bid on this piece of equipment, the contract going to the above firm.

Living-room Table Manufacturers Meet

The first annual meeting of the Association of Living Room Table Manufacturers was held in the Auditorium Hotel, Chicago, on March 3rd. A very representative gathering was present. The growth made by this infant organization during the first year has been very gratifying. A survey made among the members in attendance disclosed the fact that the average production in the plants represented was from 30 to 40 per cent. of normal, with from 15 to 40 per cent. of the average number of employees working. Costs came in for a considerable amount of discussion, and it was the consensus of opinion of those present that no further reductions in prices could be made for the present at least. Emphasis was laid on the high proportion of overhead which exists when production is curtailed and the different manufacturers were advised to give particular attention to this point in order to avoid establishing too low a level of values and to prevent financial disaster. A resolution was passed, agreeing to contribute toward the National Advertising Fund of the National Furniture Council.

Cedar Lined Chests in Period Designs

One of the newer developments in the manufacture of cedar chests is to use some of the better-known cabinet woods, such as walnut, oak, mahogany, etc., on the outside and lining the box with Tennessee aromatic red cedar. Several lines made in this way were displayed at the furniture exhibitions in Grand Rapids and Chicago. These were made in the different period designs to match the various styles in bedroom suites. Chests of this construction should have a very strong appeal to many buyers and should result in an increased demand for cedar boxes. A person who would hesitate to place the ordinary type of cedar chest in a bedroom furnished in walnut or oak, owing to the clash in colors, should welcome a cedar-lined box in a wood and style to match the rest of their bedroom furniture.

System should be the slave, not the driver of your business.

You will never have what you like until you learn to like what you have.

Read your trade paper, including the advertisements—there may be hidden gold therein.

Those who never do any more than they get paid for, never get paid for any more than they do.

Oliver 62 ft. lathe for turning masts and ship's spars.

Upholstering and Trimming

Securing Co-operation of Workmen

Secretary National Association of Upholstered Furniture Manufacturers Outlines Issues on Labor Question

By D. D. Fennell

(Concluded from February issue)

We are a wasteful people, we American people. All of mankind has been wasteful, but we, with our prodigality of resources, are especially so. To-day we take coal from the West Virginia fields, bring it up to Grand Rapids and use 20 per cent. of it. The by-products are worth 80 per cent. of the coal. What you get out of it is worth 20 per cent. The Germans have used all of the so-called by-products. Coal tar derivatives, such as aniline dyes, benzol, various medicines become soot from our chimneys to soil the landscape. Some means must be found, and soon, in America, whereby we shall convert the coal into a gas or electrical energy near the mines and distribute it over the country economically. What is true of the handling of our coal is also true of our industrial management methods. We use, as Professor James has put it, 15 per cent. of man's potential power.

I had an experience in Philadelphia, which will concretely illustrate what I mean. I was going through a plant making an analysis. The plant was given over to the making of flax rovings. The president was walking through the plant with me, and at our heels ran a little lad who was constantly getting in the way. Finally the presideant turned to the superintendent and said: "Get that boy out of here; I can't stand him around any longer." The little fellow, humiliated and apparently anxious to tell us something, began to cry. I said, "This lad has something under his hat that he wants to tell us." The president called him over, and he told us his story. He was an orphan sent over here from England. He went into this plant, working for the mere pittance of $10 per week, or something like that. Already his mind was going through that plant. He was a natural born analytical engineer. He said, "I have been trying to tell that 'cove' over there (meaning the superintendent) for a long time that he was wasting too many people in heckling his flax." The custom was to have a great number of girls take hanks of flax and sitting before the combs where the line was separated from the tow, place a single hank in the frame and remain idle until it was finished. He said, "If you will build a rectangular frame and put a trolley on it, you can put eighteen combs on a frame of a certain size, that will heckle eighteen hanks of flax at a time. One girl can sit at a given point, put one hank on with the left hand and get the other off with the right, and you can get your product heckled so much more quickly and you will only need one girl in place of eighteen. That machine was put in within two weeks and it meant a saving of thousands of dollars to that plant annually. We must recognize, gentlemen, that there is potentially, by-products and great reservoirs of possibilities in our employees that we must find a way to get out, and that is up to your own genius and your own studiousness to work out. Just as we are wasting coal to-day, we are wasting man-power, because we do not recognize that man is a mental animal primarily who insists on his right to express himself.

Give Workman New Idea

The shop committee, where properly installed and properly operated, has developed numbers of men, making them of much greater value to themselves and to their employers. Where it has failed management has been to blame usually. Means should be exercised to utilize all of the man-power we have, and make "professional" men out of our workers. What is the difference between a professional man and an ordinary journeyman worker? A professional man utilizes every bit of his ability. He gives all of his time, all of his research effort and everything he possesses to his profession. He works day and night to get out of it all that there is in it. He loves his profession,and he is absorbed in it. He spends days and nights during his college career studying every phase of his "major," because it is the one big thing in his life. That is the difference between the journeyman worker and the professional man. Help your journeyman worker to see all there is in his job for him and help him to take a professional pride in his work, giving him a chance to register his mental conceptions through some vehicle of industrial democracy and you will have tapped the well-springs of possibilities in men, such as you never knew they possessed.

Self-respect: Gentlemen, if you want to start trouble in your plant, if you want to vitiate your power of leadership, tamper with the instinct of self-respect in a human being. When you hurt the sense of dignity in any man living under the broad privilges and possibilities of the American Declaration of Independence and the American Constitution, you are treading on mighty dangerous ground. I have known men to lie on me, but I never called an employee a liar in my life. I always conspired to let him know that I knew he had lied, if he had, but I always "saved his face." I never have said, "Well, now, I've found you out and I'm through with you." I let him know I knew all about it and endeavored to show him the better way without "breaking" the man.

Some parents in bringing up their children, tell them frequently what bad children they are; scare them by telling them that lions, tigers and all sorts of wild beasts will get them if they don't behave and register in their pliants minds many other negative suggestions which are lasting and harmful. I would not tell a child of mine that he was a bad child. (I haven't any children of my own, so I can talk this way), but if he was a bad child, I would say, "Why, a good child like you should not do a thing like that." The positive suggestion if you please, the opening up of hopes and possibilities and the putting of facts squarely on the table so that a man can see his own errors is the best thing.

Never destroy the self-respect of a worker. If you

haven't a sense of humor, live with an Irishman for a while until you get it, and it will help you through many of the most difficult experiences you have to face in industry.

Instill Loyalty and Reap Co-operation

Loyalty: This instinct is gregarious, it has to do with the herd. Those horses I told you about had just one thought. They were in a circle with their heels out, and God help the wolf or other miscreant that would attack them in that formation.

Where there is lack of loyalty you will find the "I" is predominant. Loyalty is generated by confidence. You can make time studies in any plant when you say "'We' are going to do this or that." You can put in scientific management in any plant when you say "We," but you cannot when you say "I." Loyalty and "We" are almost synonymous in their effect upon men in general. I have here in the magazine called "Law and Labor" a report of a plan that has worked out successfully in Philadelphia:

"The Philadelphia Rapid Transit Co. has been operating its street railway properties on a basic five-cent fare notwithstanding the great increase in the cost of maintenance, materials, etc., since the beginning of the war. It recently became apparent that the five-cent rate was not producing revenue enough to operate on a paying basis and certain members on the board of directors of the company advocated increasing the fares to seven cents. Mr. Thomas E. Mitten, president of the company, whose announced policy is to give the best possible service at the lowest rate, contended that if the Public Service commission granted certain restrictions in the transfer system throughout the city, which had been asked for but had not been acted upon by the commission, satisfactory service could be maintained on the five-cent fare, the stockholders would receive dividends at the established 5% rate, and the increase in wages promised to the workers could be made. This situation caused a crisis in the company's affairs, and Mr. Mitten called a meeting of the elected representatives of the company in conducting the system for the past nine years, for the purpose of explaining to them the precarious financial condition of the company. A meeting was called on July 23rd, last, and after the matter had been explained the 250 men representing the 11,000 employes of the company voted unanimously to help the management in its fight for a basic five-cent fare by waiving their right to certain wage increases which the company had bound itself to pay, and to continue the present wage scale until such time as the finances of the company would permit of its granting the increases agreed upon.

Attitude of Employes

The action on the part of the representatives was followed by a referendum vote of the rank and file of the workers and so efficiently did the machinery of the employes' organization work that at the end of three hours a complete vote was recorded and every branch of the employes' co-operative organization unanimously voted to sustain their representatives. As a further expression of confidence the employes offered to loan, without interest, their savings amounting to about $1,000,000 in the treasury of their Co-operative Welfare association, and to place at the disposal of the company on the same basis their future savings which will amount to more than $1,000,000 annually for the purpose of helping the company to weather the present financial storm.

It was said by an official of the company that this was the first time in the history of street railway operations in American where so large a body of men have voluntarily agreed to forego an increase in wages, and that it marks a new departure in the relations between capital and labor. Mr. Mitten, in expressing his appreciation of the offer and commending the men for their co-operative spirit, said:

"Co-operative effort whereby men and management work to a mutual purpose has again been given a new meaning. The men in this temporary emergency, have by their action shown their confidence in and their determination to sustain the Mitten management, whose declared policy is to give the public the best possible service at the lowest rate of fare; to pay its employes the highest wages, equal to the average of other like cities; and to protect properly the P. R. T. stockholders' equities in the property."

Thus was such loyalty built up as it will be difficult to destroy. It was built on the "We" plan.

Personality in Management

Until the end of time the personality of the management will have much to do with the success or failure of any enterprise. Gentlemen, I want to tell you that one of the fundamental needs of industry on the part of the employers today is to learn how to smile. It goes further than an hour of argument and further, sometimes, than a five or ten per cent increase in wages. Accompanying your "We" with a smile. The personality of some of our managers in industry today is reprehensible.

A comprehensive shop committee plan was put into three plants and it was a failure from the day it was put in because of the unpolitic methods of the management. In one plant the man who met the committee set himself up as a god in judgment and said at the initial committee meeting, "Well, what do you fellows want? Bring on your propositions and we'll consider them." Then he banged his fist down on the table and looked out from under his shaggy brows as though he hated every man in his presence and you can imagine how far a scheme of that character would go under such conditions.

I want to say to you gentlemen, who are interested in the open shop that any conception of an open shop as a means of reducing wages beyond the reasonable market rate is a stimulus to union argument. Any open shop movement that is for the purpose of cutting a wage and giving a man less than he can earn under the usual union wage and union arrangement had better die aborning. Couple a reasonably high wage rate with a good production system and your labor will cost the minimum amount.

Pay More Rather Than Less

In the city of Chicago among upholsterers, in forty plants we have increased the wage rate thirty-three and one-third per cent. beyond the demands the union made upon us. Just now, when business is a little slack and when we are doing a lot of thinking, let us think constructively and let us do the sort of thinking that will accomplish results, gentlemen. Put the means of establishing industrial stability into your plants today, because if you do so now, when business is quiet, your men will know that you are sincere in your desire to effect right employment relations.

Within a twelve month, industry will again be active in all trades. For this resumption of activity, organized labor is well prepared to fight to the limit

of its strength, the open shop. Gentlemen, there cannot be a semblance of industrial stability under union domination, so we must open our shops and keep them open as a part of our general educational program.

If you read Samuel Crowder's article in the "World's Work on "Who Owns the United States," you will see a remarkable statement. He says in effect that the monopolistic tendencies characteristic in the days of Cornelius Vanderbilt have now been transferred from the buccaneers in capital to the buccaneers in labor, and if Cornelius would come back today he would find himself right at home in the office of the Plumb plan.

"Power takes its morality from the results of its use. If the power of trades unionism means that a man cannot work without the approval of a union, no matter what its motto for the future, no matter what its record for the past, no matter who its champions, trade unionism cannot survive in the United States."

There is no royal road to learning, gentlemen, and there is no royal road to the accomplishment of immediate industrial stability. All we can do is to guide our men aright and try to get all of the potential possibilities that are to be found in human nature out of them for their own sakes, for our sakes and for the good of posterity.

What is needed just now, is clear thinking minds, warm, just hearts, feet squarely upon the ground but when moving, moving always progressively, an optimism such as has carried America over her most difficult and strategic periods, and faces ever turned toward the sushine that the shadows may fall behind.

Standardization as a Trade Economy

Standardization is as much a trade problem as a plant problem. The individual manufacturer who endeavors to develop standardization in his plant will find himself unable to proceed very far without cooperation of some kind from the other elements of his trade. Moreover any appreciable progress in standardization by important units in trade fails to have effect upon the trade as a whole.

Being a trade as well as a plant problem any individual concern interested in obtaining the greatest possibilities of standardization among individual plants should realize the necessity of creating an active interest in standardization throughout the trade. The national trade association offers a most promising means of realizing the benefits of standardization in its fullest sense. Standardization as a trade activity has already been attempted by the following industries: Case, Musical Instruments, Boxes, Tire and Cars, Rubber Goods, Metal Lath, Cooperage, Bicycles, Clothing, Lumber, Paint, Shoes, Petroleum, and Pumps, Meat Packers, Automobile and Accessories, Railway Equipment.

There are seven especially important trade economies to be obtained by standardization. 1—Decreasing capital investment in all branches of the trade, and in individual plants. 2—Elimination of waste in experimentation and designing. 3—More speedy and reliable deliveries. 4—General decrease in prices. 5—The introduction of new prices, and machinery facilitated and made possible, 6—Elimination of false and wasteful ideas prevalent in the trade—relative especially to designing, quality and methods. 7—Decrease of ruinous competition, due to ignorance.—A. L. Smith, U. S. Chamber of Commerce.

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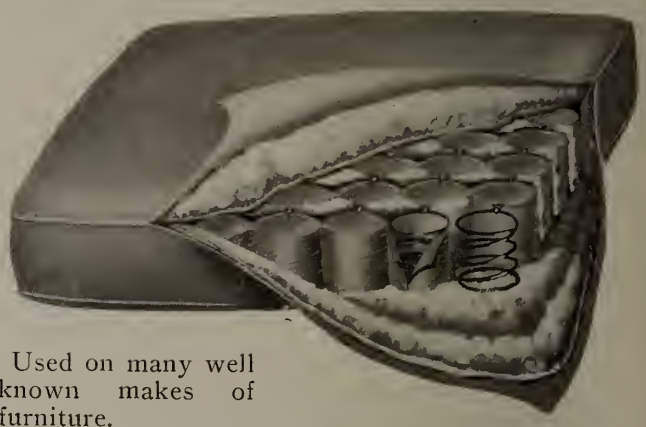

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IONIA, - MICHIGAN

Polychrome Finish in Popular Favor

Attractive on Small Articles Such as Table and Floor Lamps, Book Ends, Wall Mirror Frames and Tables— Pleasing Effect Secured

Of late, polychrome has become one of the most popular finishes upon the market, and this is deservedly so because of its real beauty. Turning to nature, in the fall one may find a vision of polychrome spread upon the rising hills, where the magic hands of the Frost King have painted innumerable soft and lovely colors upon the leaves. Contemplating such a picture from a little distance one sees only a blending of shades, there are no harsh colors to be seen, and such is the ideal that the finisher producing polychrome must strive for. Harsh, bright colors have no place in polychrome. Soft, subdued colors must be employed—those that naturally blend with one another.

The methods of carrying out this finish are as diversified as the colors employed. It is doubtful whether there are two houses that use the same method. It is also doubtful whether any house has succeeded in turning out two pieces of polychrome that are exactly alike; therefore, the finisher must realize in the beginning that this paper can give merely the basic information, or skeleton, as it were. He will have to adapt this to his own requirements, or, in other words, build up the rest of the body to suit himself. He will, however, be enabled to proceed with a reasonable degree of intelligence, and after a little practice, will be able to turn out a first-class job.

For Irregular and Ornamented Surfaces

Before proceeding further, the finisher must bear in mind the fact that it is impossible to polychrome a plain piece of wood, that is, one that has a perfectly plain surface. The furniture or other work must be ornamented with turnings and carvings in order to properly present this finish, as this gives an opportunity for design and dusty backgrounds. The fluted columns of the ancients with their many elaborate carvings were often painted in various colors, which the centuries of storms and sunshine have dimmed until they are visible to us today only through what appears to be a dusty film. Such is the origin of polychrome, and it is from the past that our designers have conceived this finish as we know it today. It will be seen, therefore, that any piece which abounds in turnings, carvings, or flutings, is ideal for this work.

Roughly speaking, polychrome may be produced in three ways: First, the stippled finish, second, using a colored enamel over the entire piece, and third, staining the piece much as in the production of the ordinary finish. The first of these methods is distinct from the other two in the preparation of the wood. This method, as its name implies, gives a stippled finish, and is very suitable for small pieces, such as table lamps, book ends, candlesticks, etc. The second method is suitable for small pieces and also for those of moderate dimensions. The third method is suitable for the largest pieces. Of course, no hard and fast rule can be laid down as to which method should be employed for any article of furniture. Ofttimes the three methods will be employed in the finishing of a single piece.

For example, take a table. The top would be finished by the third method, with a stippled border around the top, which would employ the first, and the second method might be used for finishing the legs. Then, too, a lamp base might be finished by the second method with stippled sections around the base or other portions.

With the first method, the work is given a coating of wood lacquer or shellac, which is reduced with a suitable solvent so as to form merely a wash coat. A coat of special stippling material which is now upon the market, is then applied. This coat must be plastic and will require very little thinning with turpentine. Before this stippling material dries, it is stippled. This may be done in a number of ways, but is usually accomplished by means of a stiff-haired brush. The brush is held at right angles to the work, and the operator then taps it gently over the stipple, thus drawing it up into fine points, and it is then allowed to dry in this form. Twenty-four hours is usually sufficient for drying under ordinary conditions. If the stipple is thick enough, it will draw up into long thin points. If these are not desired, a thinner mixture will allow the points to flatten out. We now have a rough surface on top of which any desired color may be applied. For example, let us take a candlestick, with turnings at the top, a fluted column, and a carved base. A coat of redwood lacquer enamel (or any other color) is next applied, and when this is dry, a thin coating of pale gold bronze should be sprayed on. Wood lacquer is by far the best material to use for this purpose. The lacquer should be reduced with a special lacquer thinner, 50 per cent, and then from one to one and one-half ounces of pale lemon yellow, bronze lining powder stirred into each pint of it. A deeper color, such as roman gold, may also be used, of course, if that is the effect desired. This mixture is then lightly sprayed on the work. The carvings on the base, and the flutings on the column, should be polychromed in harmonizing colors, or, in other words, a design in appropriate colors is painted upon the work. When this is dry, re-spray very lightly with a thin solution of bronze powder. Now prepare a very thick paste of turpentine and rotten stone, and smear this over the entire piece. Wipe this off before it dries, using a soft cloth. You will readily see that this rotten stone will cling in every little pore or crevice, when the turpentine has evaporated will give the work that old dusty look as though it had withstood the elements for centuries.

In the second method the work is first coated with a colored wood lacquer enamel. While ordinary

artist's oil colors may be employed, we can not recommend too strongly the use of wood lacquer enamel. The wood lacquer enamels not only wear very much better than the oil plants, but they also have the advantage of being waterproof, and they dry in a very much shorter period of time. While oil colors will require about twenty-four hours to dry, lacquer enamels are dry in a few hours. This point alone makes the employment of lacquer enamels very desirable, as any manufacturer will readily appreciate. To return to our method, the piece is first coated with a colored enamel. If the same color is desired to predominate over the whole piece, the work will then be given a first coater of only one color. If on a large piece, different colors of course may be employed. For example, a lamp standard might be given a coat of red lacquer enamel on top, green on the column and blue on the base. After this is dry, the work is then sprayed with a thin coating of pale bronze, as in method No. 1. The design is now to be painted upon the stand, and right here is the stumbling block of many a finisher endeavoring to produce polychrome. While it does not take an artist by any means to accomplish satisfactory results, yet the finisher must have a little artistic ability in the application of his design. As stated in the beginning of this article, bright colors must never be employed. Faded, washed-out colors are the rule. These may be obtained by suitable mixing, thin solutions, and light application. When the design is thoroughly dry, another coating of the light bronze is applied. In this case, however, the air pressure should be reduced, and the brush held quite a way from the work so that a very light coating is applied.

Next comes the coating of turpentine and rotten stone, which is smeared over the entire piece and then wiped off as before. In applying the design, ordinary artist's camel hair brushes can be used. It is perhaps unnecessary to state that in using the liquid bronze in the spray gun, some sort of an agitator should be used, as the bronze powder will settle to the bottom of the container. Most air brushes are built with this device. If it is not used, the cup containing the bronze liquid must be thoroughly stirred up at intervals. It is also well to point out at this time that, when we speak of fine bronze powders, we mean "lining powders," such as are used for the very highest grade of work, such as lining or striping automobile bodies, etc. These lining powders are extremely fine and impalpable, and are not to be confused with the ordinary coarse bronze powders generally found upon the market. Lining powders being very fine, will stay in solution for two or three hours, while a coarse powder will begin to settle almost immediately.

A Light Pore Effect

The third method is usually more or less a combination of the other two. The entire piece is first stained in the usual manner. A wash coat of wood lacquer is then applied, reduced from 60 to 75 per cent, with special wood lacquer thinner. This is then sprayed on the wood, and when dry, the wood should be lightly sanded. A thin coating of zinc or white lead is then applied. This may be obtained by rubbing up a little of the dry pigment in turpentine and adding a little japan, or zinc white ground in oil, may be used in the same manner. Zinc white ground in japan is better yet, as it has been demonstrated that this will cling better in the pores of the wood. This thin paste is then applied the same as a paste filler, only, of course, it is not supposed to fill the pore, but merely to color it gray. Where gum wood is to be finished, coarse aluminum powder will be found superior to either that or zinc. It will give a very soft effect, which is very pleasing and desirable. Note that for the aluminum powder we specify a coarse grade. A fine powder would cling too much to the work, and give it a metallic sheen which would be very undesirable and difficult to remove. After this filler is thoroughly dry, a coat of wood lacquer is sprayed on. In this case the lacquer should be reduced about 40 per cent with special wood lacquer thinner. When this is dry, it may be waxed or finished with a mixture of turpentine or rotten stone. The border around the top of the table may then be finished with the stippled effect and the legs with their turnings and carvings may be finished by using the second method. Designs are sometimes employed by means of Decalcomania transfers, or where expense is not objectionable, they are painted on by hand. These designs are, of course, only employed on large pieces, as for example, the center or at the four corners of the table top. Drawer fronts are sometimes ornamented in like manner.—"Furniture Manufacturer and Artisan."

Molds and Wood Destroyers

Not all fungi which live upon wood impair its strength, but conditions which promote the growth of molds, blue-stain fungus, and other non-injurious fungi are usually favorable to the growth of the wood destroyers, and these may be active on the same wood bearing the molds. Hence, the presence of mold on timbers intended for any structural purpose should cause them to be looked on with suspicion.

In the early stages of their growth the molds and the wood-destroying fungi sometimes have a very similar appearance, and there is no simple means known to the U.S. Forest Products Laboratory by which lumbermen and wood users can separate them at sight. The surface growth of molds is generally cottony or felty in appearance, the mycelium or fine mold threads are interwoven, never compacted into membranous sheets or strands. The mycelium of wood destroyers may be fluffy and glistening, but more usually are compacted into strands or fan-shaped patches.

The characteristic feature of mold growth on wood is the fact that the minute threads which enter the wood do not bore into the wood fibres or dissolve them away. They pass through the spaces between the fibres or enter them through the natural openings, called pits, which are found in the walls of certain cells. Starches, sugars, and other contents of wood cells constitute the food of the molds.

The wood destroying fungi are able to send their threads right through the wood fibres, breaking down the cell walls and utilizing portions of this decomposed material as food. This action very markedly weakens the wood, making it crumbly, stringy, or spongy,—in other words, producing rot or decay. The presence of wood destroying fungi in an advanced stage of growth is evidenced by fruiting bodies, commonly called mushrooms, toadstools, or conchs.

The principal economic loss caused by molds is through the staining or discoloration of the wood. No great injury may be caused by the wood destroyers in their early stages; but their work will continue and finally result in the destruction of the wood.

The Drying of Varnish in Special Kilns

Output of Finishing Department Increased by Speeding Up Drying of Varnish—Taking Advantage of Natural Movement of Air—Uniform Conditions Essential

By C. A. Cutler*

In another article, the manner in which varnishes harden and the effect of heat in this process, was explained. It was assumed that the simplest manner of applying heat to the freshly coated surface was to place the piece in a specially constructed heated room, in other words in a kiln. The requirements, to obtain the best results, were an even and controlled temperature, rapid circulation and very efficient ventilation. Except in a specially constructed room these conditions would be very difficult to maintain.

If heat effects the speed of drying then it follows that to dry evenly the temperature must be applied evenly. The mere installation of sufficient heating surface to raise the temperature of a given sized room to a given temperature would result in a difference of temperature at the ceiling and at the floor level that would cause widely different drying times. These articles placed near the ceiling would be dry sooner than those near the floor. The difference in temperature between the floor and the top of the kiln is largely determined by the height of the room, but as a matter of economy of floor space and construction expense it is usual to build kilns as high as it is practical to pile the goods that are to be placed in the kiln. This height in most cases would be eight feet or over which is quite sufficient to cause ten to twelve degrees difference of temperature between floor and ceiling. A difference as great as this would make a great difference in the drying time. An automobile body standing on its "nose" in a condition like this would be hard enough on the upper end to rub when the "nose" was still far from dry. To save all the time possible, all the material in the kiln must be treated to the best possible drying conditions. If it is determined that a certain temperature is best, then that temperature should be maintained in all parts of the kiln.

Circulation and Temperature

A heating surface gives off heat in two ways. One is by heating the air surrounding and in contact with the heater which results in expanding this air until it is light enough to rise above the color air at the level of the heater. The other is direct radiation, called radiant heat. In the first case, the air rises to the ceiling and remains there until cooled to a temperature less than that of the air rising from the heater. Then it begins to descend to a lower level and gradually finds its way to the floor where it remains until re-heated. This is called a gravity circulation because it is dependent entirely on the difference in weight of air at different temperatures. A circulation of this sort is very slow unless there is a great difference of temperature caused by radiation through the kiln walls or because of ventilation. Heat costs money and, therefore, it is very desirable that the kiln walls do not radiate heat more than necessary and that the ventilating system be of a type that will remove as little heat as possible and still keep the air fresh.

Radiant heat is that heat that travels in straight lines in all directions from the heater. It is the same kind of heat that one feels on their cheek when sitting at a window in a train as it passes a fire alongside of the track. This kind of heat is like light. It will pass through transparent material, like glass. It will reflect from a smooth bright surface in the same way as light and it will be absorbed by a dull dark surface just as light would be. Radiant heat will raise the temperature of the surfaces in direct line with the heaters but will not heat the surfaces not in direct line. Therefore, radiant heat is another cause for uneven heating and should be eliminated as much as possible. This will explain why some kilns dry better in one part than another even though a thermometer protected from radiant heat shows the temperature to be the same in all parts of the kiln.

Providing for Even Circulation

The coolest air in the kiln will be at the floor level and inasmuch as this is the air that must be brought up to the desired temperature, the heaters should be on the floor line or some means provided to bring the floor level air to the heater. In lumber kilns there is usually a space under the lumber where the cooler air is collected for reheating. This same sort of "pit" should be provided in a varnish kiln. It is best done by piling the materials in the kilns so that there is a free space between them and the floor. This allows the colder air on the floor to flow direct to the heater instead of having to find its way in and out around the various piles.

The disadvantages of uneven heating have been shown. The simple remedy is the increase of circulation of the air so that it will return to the heater before it has had time to lose enough of its heat to effect the drying time. If the movement of the air in a kiln is going to be dependent entirely on natural gravity circulation, its speed will be directly in proportion to the difference in temperature except for such speed as can be gained by making its path as straight and short as possible. So if the circulation is to be increased without difference in temperature some mechanical means must be used. Fans and blowers, if properly designed or installed, will increase the speed of circulation and maintain an even temperature in all parts of the kiln.

Follow Natural Lines of Movement

The circulation, even though assisted by blowers, should always be in the path or direction of a natural gravity circulation. If a circulation was set up in an opposite direction it would have to be powerful enough to overcome the natural circulation which would be a waste of power, but the big difficulty would be the uneven distribution of the air currents. It is just as necessary to have the circulation even as it is to have the heat even, as one depends upon the other. The most even heat and circulation is had when the heated and conditioned air does its work on its way downward instead of upward. The object of heating the air is to furnish heat or energy to the varnish sur-

*President Cutler Desk Co., Buffalo, Manufacturers Cutler Dry Kilns.

face. To do its work it must give up some of its heat but in doing so it becomes cooler and, therefore, less able to further perform its function of heating as well as giving up oxygen and absorbing fumes. The sooner the air can be reconditioned the more work it will do. If it is heated and allowed to rise up through the materials it starts work immediately. That is, it will get cooler, take on fumes and give off oxygen until it reaches a state of balance, or a layer of air that is of the same temperature as itself. Then it will continue to give off heat, although not in motion until it becomes cool enough to fall, then it wants to go back in the same path it came up. In its downward trip it meets the upcoming air and thus slows up the air movement, both up and down. The air that has done its work is kept in contact with the surfaces longer than it should be and the fresh conditioned air is kept from contact longer than would be the case if the motion was all in one direction. Again, in order to keep a given temperature in all parts of the kiln, the air rising from the heater up through the materials must be somewhat hotter than the desired temperature in order to provide for the heat radiated through the walls and the heat needed to bring the material up to the required temperature. If the kiln temperature is to be attained in a reasonably short time, the temperature of the rising air would often be much greater than desirable so far as the material is concerned.

(Continued in April issue)

That Valuable Suggestion Box

The suggestion box often brings forth ideas and suggestions that can be used to increase production, reduce costs and improve conditions and methods in the plant. Have you made use of this valuable aid? Offer a weekly or monthly prize of a few dollers or pay, according to their value, for all ideas which are found to be practical, and see what results are forthcoming. One manufacturer in calling the attention of the employees to the suggestion boxes which were being placed in the plant says in part:

You can't help seeing how things could be done even a little better in your own department. You know about details that cannot come to the attention of the firm unless you call attention to them. Details about improving or increasing our output. Let me outline a few things that may indicate what kind of suggestions we want:

1. What should be done to eliminate waste, both in labor and material?
2. How can we increase production?
3. What is your idea about handling our work?
4. Do you lose time in waiting for materials? If so, what is the cause; how could the condition be improved?
5. Are our machines and tools in proper order and of the right kind?
6. Are the materials we use of the right kind, or do you know of a better quality at less money that would serve our purpose?
7. How can we make and pack our goods better than at present?
8. Can you suggest a better way of laying out departments?
10. Are all of our operations standardized — any surplus motions? Can you suggest a way to get more out of your machine with the same amount of human energy?

Give five minutes thought to your own department each evening for a week or two, then write down what you have thought out and put it in the suggestion box. Perhaps you will win a five or ten dollar prize; at least it will show the firm you are thinking and trying to produce more and better work at a time when we most need it.

Chamfering Corners of Hardwood Boxes

Usually this job is for the operator on the shapers, and if he has a high speed machine he is in a position to handle the job in a satisfactory way, otherwise the work will have to be fed slow or the grain will be torn and chipping in places.

One of the few men who created an idea is willing to convey this idea to anyone who can use it to any advantage, and which has proven very successful. Use a circular saw ¼" thick and 8" in diameter on a high-speed horizontal arbor and run the boxes over this saw. The boxes are positioned and guided by a simple stationary trough which straddles the saw; thus the operator has no difficulty in holding the box up to the cutters as it assumes the correct position of its own accord. The operator pushes the boxes across the trough at a fast rate and the finished chamfer is remarkably smooth. This is accounted for by the fact that the cutting circle is large, the trim speed correspondingly high and more cutters are brought into action. The saw will stay sharp for a week at a time while in almost continuous service.

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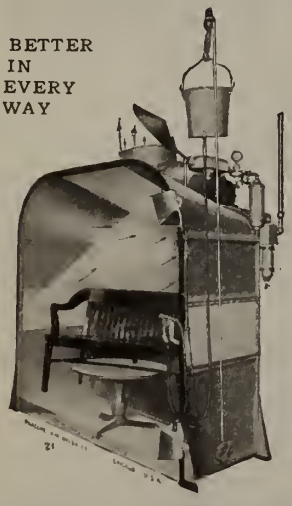

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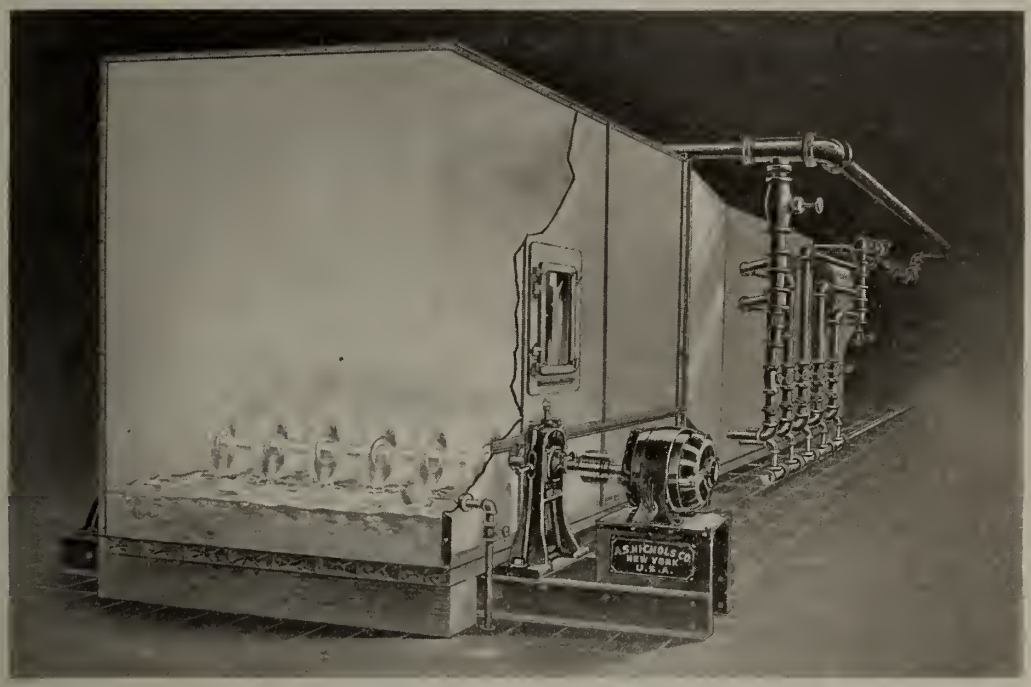

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That these results are obtained the year round, in Summer and Winter(irrespective of outside weather conditions?

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Veneers and Panels

Would You Lay Five Ply in One Operation?

Is This a Good Method to Follow?—Certain Points That Require Special Attention—Present Problems of Its Own

By S. H. Johnstone

"Is it possible and advisable, in making five-ply panels, to lay the crossbanding and the face veneers in one operation? I have done it both ways but am now laying the different plies at the same time by running the crossbanding through a glue spreader and laying down first the back, then crossbanding, core, crossbanding and face veneer. Have had a little trouble with some of these panels, and before changing back would like to find out if there is anything wrong with this method and what is the best practice."

The above extract was taken from a letter sent in by a well-known furniture maker. It raises a question which, no doubt, has claimed the attention of many manufacturers of built-up stock. A desire for high production might tempt a manufacturer to adopt the quicker and easier method, while caution and experience might suggest that laying a five-ply panel in two operations was the safer procedure.

Here is a question which might be discussed to good purpose. Expressions of opinion and suggestions are invited on the advisability of laying five ply in one operation and how satisfactory results may be obtained. Read Mr. Johnstone's article and then let us hear from you.—The Editor.

The ideal method, if quality of product and freedom from trouble are the sole considerations, is to prepare the cores from sound, dry stock, eliminate the moisture from the wood surrounding the glue joints before surfacing, lay crossbanding, dry thoroughly, sand with drum sander and finally lay the face stock. When such a schedule is followed and due attention given to every detail of each operation, the results are all that could be desired.

What happens if the crossbanding and outside veneers are laid in one operation? Perhaps nothing. The resultant panels might be all that one would wish for, and then again they might not. When laying five-ply panels in one operation, any one of a number of troubles may occur. Do not take this to mean that it is not practical or advisable to lay the panels in this way for many concerns are doing it with apparent success and with very little trouble. There are, however, certain points which must be considered and certain precautions which should be taken.

Prevent Face From Sanding Through

In the first place rotary cut crossbanding varies in thickness and is inclined to run thick and thin in spots. If the crossband core is laid first and sanded, these inequalities will be removed. When the five-plies are glued in one operation, all inequalities and variation in thickness must be rectified when sanding the face stock, with the result that often the veneer is sanded through where the high spots occurred. This may be overcome, to a large extent, by using thicker face stock. We may take for our first precaution that it is not advisable to employ thin face veener, such as 1/25" or 1/28," when laying all plies in one operation. The material should be 1/20" thicker.

As all variations in thickness in any of the plies or core results in an uneven distribution of pressure, even greater attention must be given to the cauls and their care. If this is not done, a certain amount of trouble will be experienced from loose veneer and blisters. The second precaution is that all cauls should be kept clean, inspected at regular intervals and all hollows and worn spots worked out.

What About the Core?

The cores must be given careful attention. A layer of 1/20" crossbanding and one of 1/20" face stock will not overcome planer marks, rough spots and other imperfections in the core. As instanced before, when the three-ply cores are laid separately, such faults will be partially, if not wholly, rectified when the crossbanded core is sanded. The third precaution then will be to give special attention to the surfacing and sanding of the core proper and also to the selecting of the crossbanding.

The question of the time required to place the work under pressure is also of utmost importance. Unless this part of the work is hastened, the crossbanding may expand, buckle and overlap, thus spoiling the whole panel. As it takes a little longer to lay up a press-load of five-ply than of three-ply, if the same number of panels are handled, those laid first will be able to take up an unusually large quantity of moisture before the pressure goes on. For our fifth precaution, utmost speed in applying pressure, even to the extent of working smaller press loads.

If Animal Glue is Used

With cold glues, like vegetable and casein, the question of applying heat does not enter, but when using animal glue, this is a very important point. The reason for using warm cauls when working with animal glue, is to warm and soften the glue which may have become chilled and thick. Unless this glue is warmed in this manner, it will not hold the different plies together. When laying five-plies in one operation, to reach the second glue line, the heat must travel through two plies of wood. It is doubtful if the amount of heat in the ordinary caul would penetrate this far. If it does, it may not raise the temperature to which the cauls should be heated (they should never be so hot that they cannot be handled comfortably with bare hands), any additional heat must be supplied by warming the core and crossbanding. As a sixth precaution, the core and crossbanding should be warmed when using animal glue.

The core, crossbanding and face stock must be thoroughly dry before laying. If no provision has

been made for redrying the veneer material, it can be dried between hot cauls. The seventh precaution is to see that all materials are thoroughly dry. This is of vital importance.

The glue in five-ply panel laid in one operation will take longer to set than if the work were done in two operations. This is because more moisture was introduced by the larger amount of glue applied. To permit the glue to set and harden before the pressure is released, the eighth precaution will be to leave the stock in the retaining clamps for a longer period, fully 24 to 36 hours.

As an unusually large amount of moisture was introduced with the glue and as there is more wood from which it must be removed, greater attention must be given to the drying of the panel. Not only should it be left in the drying room for a longer period but greater attention must be given to the piling and sticking. If the panels are dried in a room or kiln in which the temperature and humidity are constant, a stated drying time may be worked out, but if allowed to dry under ordinary atmospheric conditions, the drying period must be long enough to ensure that all moisture has been eliminated. As a ninth and last precaution, give special attention to the drying of the panels, and make frequent tests to ascertain the moisture content of the dried panels.

New Rules Governing Rotary Cut Veneers

Rotary Veneer Section of American Hardwood Manufacturers' Association Adopt New Rules—Definition of Standard Grades—Effective Immediately

At a meeting of the Commercial Rotary Veneer Club of the American Hardwood Manufacturers' Association, held recently in Memphis, Tenn., a new sales code and set of grading rules were adopted. These will be put into effect without delay.

The officers elected for the ensuing year are S. M. Nickey, Nickey Bros., Inc., Memphis, Tenn., chairman; E. B. Snyder, Memphis, vice-chairman; J. C. Hill, High Point, N.C.; Dan Stewart, Tuscaloosa, Ala., T. V. Ashby, Jackson., Miss., and W. J. Lovelace, Cotton Plant, Ark., directors.

The new rules and sales code are as follows:

Sales Code

When quotations, orders or contracts covering the sale of Commercial Rotary Cut Veneers are made or entered into with members of the American Hardwood Manufacturers' Association and contain the clause "subject to the sales code and inspection rules of the Commercial Rotary Veneer Department of the American Hardwood Manufacturers' Association, adopted December 1, 1920," all transactions shall be governed and controlled (with such exceptions as are specifically made in writing) by the said sales code and inspection rules.

All quotations are made subject to prior sale, immediate acceptance, change without notice and purchaser's credit rating proving satisfactory to the seller. If during the life of any order or contract the financial responsibility of the purchaser becomes impaired or unsatisfactory to the seller, then cash payment for accounts due or goods to be shipped may be demanded and in default of which the order or contract may be cancelled by the seller.

Orders, Contracts, Acknowledgments

All orders or contracts shall be in writing and signed by both parties or signed by the buyer and accepted in writing by the seller.

All orders or contracts are subject to the approval and confirmation at the main or home office of the seller and are not binding unless confirmed in writing.

Acknowledgment of orders by the seller shall state fully and in detail the sellers' understanding of the order or contract and shipment to be made in accordance herewith. Omissions, errors or misunderstandings should be corrected by the purchaser by return mail.

Any changes or alterations in an order must be agreed to and confirmed by both parties.

All details in regard to specifications, grade, part piece stock, the dimension in length with the grain and the dimension in width across the grain and all other details must be explicit.

Loss or Damage in Transit

The seller does not guarantee safe delivery nor insure against breakage, loss or damage to material while in transit.

Dimension Stock

Orders for log run, sheet stock or dimension cut veneer are not subject to cancellation, unless the seller fails to have the stock ready for shipment within the time specified and then the buyer must give the seller ten days' notice to ship the goods or any portion of the order that is ready for shipment before the order can be cancelled and the seller shall have the right to ship that portion of the order ready for shipment or that portion that is cut and in process of drying.

Invoices

Promptly upon acceptance of shipment by initial line of railroad, the seller shall mail to the purchaser an invoice, giving full information in connection with the shipment. Invoice to bear date coincident with bill of lading, and errors, omissions, etc., are subject to correction.

General Contingency Clause

Quotations are based upon and orders and contracts accepted under a "General Contingency Clause" which recognizes that the seller shall not be held liable for delays or non-delivery of material when occasioned by strikes, floods, fires, epidemics, inability to secure cars, delays of carriers or any other cause whatsoever beyond the control of the seller, and shipments and deliveries may be delayed or suspended until such causes and their effects have been removed.

Terms of Payment

All stock is sold on a basis of "f.o.b. mill, net cash thirty days from date of invoice."

If the buyer desires, and it is agreeable to the seller, then settlement may be made by ninety day acceptance, provided acceptance is furnished to the seller within ten days from the date of the invoice and, further, provided that the buyer shall pay interest

to the seller for the period of time taken beyond thirty days from date of invoice and interest shall be at current banking rate and acceptance shall be made payable in funds at par in the federal reserve bank district in which seller is located.

Reinspection or Remeasurement

In the event of complaint by the buyer on the quality or grade of the material shipped, the purchaser shall receive and unload shipment and hold any rejected or disputed material intact, properly protected, and shall, within five days from receipt of shipment, file complaint with the seller. If the complaint is on measurement or on both inspection and measurement, the entire contents of the carload must be held intact and payment of the freight charges or of the invoice shall not be considered as an acceptance of the shipment by the buyer nor shall such payment work a forfeiture of the right of the buyer to enter complaint and to have adjustment of same.

Upon receipt of complaint from the purchaser and in the event an adjustment cannot be made between the seller and the purchaser, then the seller may request the American Hardwood Manufacturers' Association to appoint an arbitrator to provide reinspection or remeasurement, as the case may be, according to the inspection rules of the Commercial Rotary Veneer Department of the association in effect at the time of the execution of the contract and the purchaser shall lend all reasonable assistance to facilitate the inspection or remeasurement.

A certificate is to be issued by the arbitrator, showing the name of the seller and the purchaser and the results of the reinspection or remeasurement and the original copy of this certificate to be mailed to the seller and duplicate to the purchaser.

The party at fault shall pay all costs of such reinspection or remeasurement and the decision of the arbitrator shall be binding upon both the purchaser and seller.

The purchaser shall accept all material of the grade and kind purchased and all of the lower grade of material, not to exceed ten (10) per cent, and pay for said lower grade material at the proportionate price to be fixed by the arbitrator.

General Rules

All rotary cut stock shall be of uniform and standard machine gauged thickness. Stock of all grades and kinds must be cut solid and dried so that it will not mould or damage in transit and be sufficiently flat to straighten under the press without splitting.

Surface dimensions shall always be given: first, the thickness; second, the width across the grain; and, third, the length with the grain.

All specifications for special stock, not covered by these rules, shall be a matter of special contract between the buyer and the seller.

Measurement

All log run and sheet stock of random widths shall be measured by taping and all dimension stock, in all grades, shall be computed on the basis of the sizes given without allowance for trimming.

The standard grades of commercial Rotary Cut Veneer shall be as follows:

1. Faces.
2. Backs.
3. Dimension Stock.
4. Drawer Bottoms.
5. Crossbanding.
6. Core or Center Stock.
7. Unselected Log Run.
8. Unselected Sheet Stock.

Cutting

The word "cutting" as used in these rules means a portion of a sheet of veneer obtained by cross-cutting or ripping, or both. The terms "clear face cutting" as used in these rules means a portion of the sheet of the veneer to be face grade and to be obtained by cross-cutting or ripping, or both.

GRADES

Faces

Stock of any thickness, in any kind of wood, unselected for color and shall be free from all defects except slight splits that will close in laying. Selected or figured face stock of any thickness to be the same grade as face stock except it shall be selected as to color or figure.

Backs

Stocks of any thickness, in any kind of wood, and shall admit sound defects and pinworm holes and splits not open to exceed 1-8" in width.

Dimension Stock

All dimension stock, in any thickness, in any kind of wood, shall be machine cut to the length specified and if allowance is desired for trimming specifications should be for length required, including trimming, and stock is to be billed and measured at actual length cut and all dimension sizes may be a trifle full as to width. Unless otherwise specifically stated all stock for dimension sizes is to be cut to the sizes specified in one piece stock and in addition to include what part pieces the logs produce. Part pieces are to be of sufficient width to make allowance for jointing and part pieces are to be as wide as possible.

All dimension stock must be cut reasonably square.

Standard Drawer Bottoms

Stock of any thickness, of any kind of wood, to be unselected for color. To be free from splits but may permit small tight knots; otherwise to be face grade.

Crossbanding

Stock 1-16" or less, in any thickness, in any kind of wood, to be unselected for color, free from open defects but shall admit pinworm holes, sound discolorations and splits that will close in laying. (Splits to be not more than 10 per cent of the length of the peice.)

All stock not exceeding 40" in length shall contain the following percentages of whole sheets:

All stock up to and including 30" widths, 50 per cent whole sheets.

All stock 31" to 44" widths, inclusive, 40 per cent whole sheets.

All stock 45" to 59" widths, inclusive, 35 per cent whole sheets.

All stock 60" to 73" widths, inclusive, 25 per cent whole sheets.

All stock 74" to 86" widths, inclusive, 15 per cent whole sheets.

(On piece stock 1-2" must be allowed on each piece for jointing).

Core or Center Stock

Stock of 1-15" or thicker, in any kind of wood, to be unselected for color, to be free from open defects, but shall admit pinworm holes, discolorations, splits that will close in laying and other sound defects. (Splits

to be not more than 10 per cent of the length of the piece.)

All stock not exceeding 40" in length shall contain at least the following percentages of whole sheets:

All stock up to and including 30" widths, 50 per cent whole sheets.

All stock 31" to 44" widths, inclusive, 40 per cent whole sheets.

All stock 45" to 59" widths, inclusive, 35 per cent whole sheets.

All stock 60" to 73" widths, inclusive, 25 per cent whole sheets.

All stock 74" to 86" widths, inclusive, 15 per cent whole sheets.

(On piece stock 1-2" must be allowed on each piece for jointing).

Unselected Log Run

Unselected red gum, selected red gum, tupelo, cypress, yellow pine, yellow poplar, basswood, beech, elm, maple, ash, sycamore, hackberry and cottonwood must grade at least 50 per cent clear cutting in face grade and no cutting to be considered that is less than 6" wide by 24" long in all thicknesses up to and including 1-15", the stock shall be 6" and up wide; to be 48" and up long and at least 50 per cent 60" and longer.

In thicknesses of 1-12" and thicker, the stock shall be 6" and up wide; to be 36" and up long and at least 50 per cent 60" and longer.

Selected log run shall be of the same specifications except that it shall be selected for color.

Unselected Sheet Stock

Red oak, white oak, selected red gum, unselected red gum, cypress, yellow pine, yellow poplar, ash, walnut, cottonwood, tupelo and black gum of any thickness, must grade at least 75 per cent clear cutting in face grade and no cutting to be considered that is less than 6" wide by 24" long.

In all thicknesses up to and including 1-15", the stock shall be 8" and up wide; to be 48" and up long with at least 50 per cent 60" and longer.

In all thicknesses of 1-12" and thicker, the stock shall be 6" and up wide, at least 85 per cent 11" and wider; to be 36" and up long, at least 90 per cent 60" and longer, and must have 75 per cent of the total 86" and longer.

Selected sheet stock shall be of the same specifications except that it shall be selected for color or figure.

Where crating is specified on sheet stock grades, the veener shall be crated to length random widths.

(In red and white oak, unselected sheet stock, bright sap which shows the same character and grain figure as heartwood shall not be regarded as a defect.)

The Question of How Many Plies

In making up plywood for a particular use the question frequently arises, Should three plies or more than three be used to obtain the required thickness? Some data from tests by the U. S. Forest Products Laboratory may be of assistance in answering this question.

An increase in the number of plies results in a decrease in the tensile and bending strength parallel to the grain of the faces and an increase in the corresponding strength at right angles to the grain of the faces.

If the same bending or tensile strength is desired in two directions, parallel and perpendicular to the grain of the faces, the greater number plies the more nearly the desired result is obtained. It must be borne in mind, however, that plywood with a large number of plies, while stronger at right angles to the grain of the faces, can not be so strong parallel to the grain of the faces as three-ply wood, and hence a three-ply panel is preferable where greater strength is desired in one direction than in the other.

Where great resistance to splitting is necessary, as in plywood that is fastened along the edges with screws and bolts and is subjected to forces through the fastenings, a large number of plies affords a better fastening.

It is common experience that a glued joint is more likely to fail when thick laminations are glued with the grain crossed than when thin laminations are glued. The same weakness exists in plywood when thick plies are glued together. When plywood is subject to moisture changes, stresses in the glued joint due to shrinkage are greater for the thick plies than for the thin plies. Hence in plywood constructed with many thin plies the glued joints will not be so likely to fail as in plywood constructed with a smaller number of thick plies.

Wood, as is well known, is a non-homogeneous material, with widely different properties in the various directions relative to the grain. This difference must be recognized in all wood construction, and the size and form of parts and placement of wood should be such as to utilize to the best advantage the difference in properties along and across the grain. Were wood a homogeneous material such as cast iron, having the same strength properties in all directions that it has parallel to the grain, it would be unexcelled for all structural parts where strength with small weight is desired.

The Forest Products Laboratory has found that the tensile strength of wood may be 20 times as high parallel to the grain as perpendicular to the grain, and its modulus of elasticity from 15 to 20 times as high. In the case of shear the strength is reversed, the shearing strength perpendicular to the grain being much greater than parallel to the grain. The low parallel-to-the-grain shearing strength makes the utilization of the tensile strength of wood along the grain difficult, since failure will usually occur through shear at the fastening before the maximum tensile strength of the member is reached.

The large shrinkage of wood across the grain with changing moisture content may introduce distortions in a board that decrease its uses where a broad, flat surface is desired. The shrinkage from the green to the ovendry condition across the grain for a flat-sawed board is about 8 per cent and for quarter-sawed board about 4½ per cent, while the shrinkage parallel to the grain is practically negligible for most species.

It is not always possible to proportion a solid plank so as to develop the necessary strength in every direction and at the same time utilize the full strength of the wood in all directions of the grain. In such cases it is the purpose of plywood to meet this deficiency by cross banding, which results in a redistribution of the material.

In building up plywood a step is made in obtaining equality of properties in two directions, parallel and perpendicular to the edge of a board. The greater the number of plies used for a given panel thickness, the more homogenous in properties is the finished panel. Broadly speaking, what is gained in one direction is lost in the other.

OAK MAHOGANY CIRCASSIAN MAPLE
VENEERS
BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY
Importers and Manufacturers
Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, CINCINNATI, OHIO.

Mahogany Lumber
Mahogany & Walnut Veneers

Located close to the source of supply down in New Orleans, we have an up-to-date, well-equipped mill, exclusively employed in cutting into Lumber and Veneers the fine Mahogany logs our ships bring in direct from the tropics.

The Freiberg Mahogany Co.
CINCINNATI, OHIO NEW ORLEANS, LA.

NATIONAL VENEER & LUMBER CO.

AMERICAN WALNUT VENEER
Long Wood and Butts
QUARTERED WHITE OAK VENEER
Sawed and Sliced

1635 West Michigan Street - INDIANAPOLIS, INDIANA

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SAVE FREIGHT

Rotary Cut Birch and Gum

Why pay freight on gum veneers from southern points when our cutting mill is so near the border.

PANELS

We manufacture Tops, Fronts and Panels of all kinds

Ask for our "Ready to Ship" Stock List

MOHAWK VENEER CO., INC.

Warren, Pa.

Plywood Dept. Warren, Pa.

Cutting Mill Salisbury Center, N.Y.

Panels and Rotary Cut Veneers

Considering the present large demand for high-grade cabinets and the extreme scarcity of good panels, it may interest you to know, Mr. Manufacturer, that we now have in stock, and can make immediate shipment of, a very large quantity of both three and five-ply panels for talking machines in either

Mahogany, American Walnut, Quarter Sawed Oak

We also have for immediate disposal a large supply of birch and gum panels adaptable for shelving.
We are in position to take orders for future delivery. Order now for holiday trade.
We have just received a big shipment of single ply spruce for horn stock. Write us for prices on cross banding and core stock.

George G. Roberts

22 QUINCY STREET, CHICAGO, ILL.

Litton Veneer Co.

Manufacturers

American Walnut, Figured Gum, Sliced Quartered Oak, and all Kinds of Figured Woods

Walnut and Quartered Oak Lumber

Office and Mill

ROCKFORD - ILLINOIS

Immediate Delivery

FROM STOCK OR TO YOUR ORDER

Veneered Panels

Veneers—Wood Dowels

Adolph Sturm Company

ESTABLISHED 1869

542-544 West Washington Street,

Offices, Mills and Warehouses

CHICAGO, ILLINOIS, U.S.A.

Reg. U.S. HB *Pat. off.*

EST. 1867
INC. 1904

Northern Grown Oak

Knoweldge of our customers' needs and our ability to exactly meet those needs, recommend our service to you as a careful and experienced buyer.

We specialize in Northern Grown Oak, American Walnut and Hardwoods, Veneer, sawed and band sawed, and rotary cut Poplar at our Burnside, Kentucky, Mill.

Will you not give us an opportunity to demonstrate our ability to serve you?

Hoffman Brothers Company

EST. 1867. FORT WAYNE, INDIANA INC. 1904

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Western Office, 516 Lumber Exchange, MINNEAPOLIS, MINN. Mills at GLADSTONE, MICHIGAN

The Northwestern Cooperage & Lumber Co., Gladstone, Mich.

THE HOME OF "PEERLESS" STANDARD BRAND PRODUCTS

Manufacturers of

"PEERLESS" ROTARY CUT VENEERS

in Birch, Elm, Basswood, Maple, Ash and Beech for all purposes

Also hoops, liners and staves for manufacture of packages

Also "Peerless" Rock Maple, Beech and Birch flooring; Hemlock lumber; Lath, etc.
"Peerless" products are standard everywhere and you are always exercising Safety First in using them. Try us next time.
(When writing mention Canadian Woodworker)

Send for the Latest Issue of the

Veneer Price-Stock List

Indispensable to Veneer Users

In figuring costs and keeping in touch with prices, also showing where veneers of all kinds may be purchased for IMMEDIATE shipment at lowest prices.

THE VENEER PRICE-STOCK LIST is issued monthly. It is NOT a market letter, but reflects CORRECT market prices obtaining on veneer.

If you are not receiving the

Veneer Price-Stock List

Write

TEST OUR SERVICE
AND BE CONVINCED

VENEER MANUFACTURERS COMPANY

1036 W. 37th Street, Chicago, U.S.A.

Veneers and Panels

PANELS

Stock Sizes for Immediate Shipment. All Woods. All Thicknesses. 3 and 5 Ply or made to your specifications

We are Chicago agents for WOCO FIR PANELS, and carry a full and complete line in all stock sizes and all thicknesses at our Chicago warehouse for immediate shipment.

J. J. NARTZIK, Inc.

1966-76 Maud Ave., - - - CHICAGO, ILL

Mills: Des Arc, Ark. and Grand Rapids, Minn.

WE HAVE A COMPLETE STOCK OF 3 and 5 PLY PANELS IN VARIOUS WOODS AND THICKNESSES FOR QUICK SHIPMENT

Also offer 3/8" 3 ply Fir s-2-s Panels for Drawer Bottoms and Backing.
1/8" Rotary Cut Northern Red Oak
1/8" Rotary Cut Northern White Oak.
1/8" Birch Veneer 6 to 36" wide 60 to 86" long.
Panels also made to your dimensions.

Write for Prices

GEO. L. WAETJEN & CO.

Milwaukee - Wisconsin

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Poplar and Walnut
Veneers

We specialize in large size poplar veneers as we have extra fine poplar logs. We can cut veneer up to 10 feet square.

Our walnut veneer cannot be beat, both in plain and figured wood.

Write us for prices.

Central Veneer Company
Winter Ave. and Belt R. R., INDIANAPOLIS, IND.

Sovemanco
Southern Veneer Manufacturing Co., Inc.
LOUISVILLE, KY.

Importers and Manufacturers of all kinds of Sawed, Sliced and Rotary-cut

VENEERS

CARRYING

a large stock of selected Mahogany, Figured and Plain Walnut, Walnut Butts, Sawed and Sliced Quartered Oak and Sycamore and all other native woods.

1,000,000 Feet
QUARTERED RED GUM
to select from

WE Respectfully solicit your inquiries

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Quality and Service

Ask

Henry S. Holden
1742 Monadnock Block
CHICAGO, Ill.

Wide Veneer

One carload of 1/20″
Quartered White Oak
Sawed Veneer
12″ and wider

Ready for Quick Shipment.

Memphis Veneer & Lumber Co.
MEMPHIS, TENN.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Guelph Patent Cask Co., Ltd.

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QUALITY *SERVICE*

Canadian Veneers and Plywood

For Canadian Customers

Rotary Cut Textile Dried

We specialize in 3/16" and ¼," 3 ply Drawer Bottom and Panel Stock—cut to exact size

QUALITY *SERVICE*

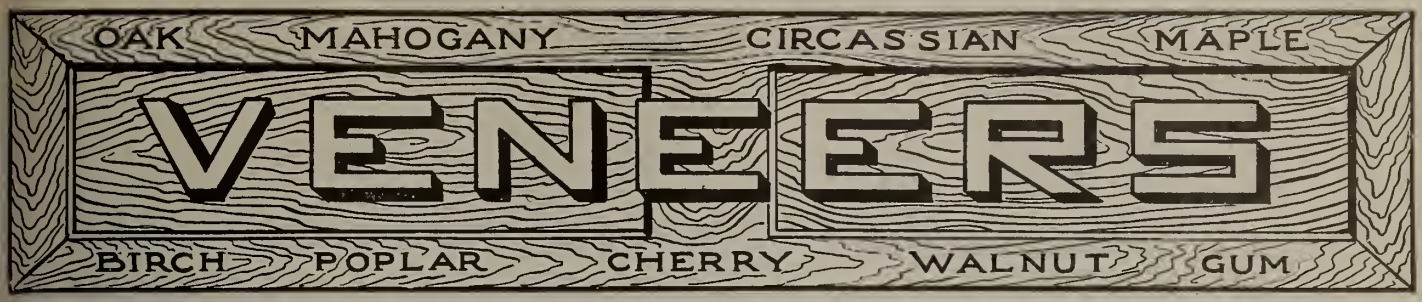
PICKREL VENEER COMPANY, Inc.

MANUFACTURERS OF

American Walnut

Exclusively

Woodruff and River *New Albany, Ind.*



INVESTIGATE

P.-J. SEVRICE

For high-grade rotary cut veneer, that is smooth and evenly cut and dried by mechanical means to any percentage of moisture desired.

We also operate large band mills where all kinds of southern hardwood lumber is cut from our own tract of timber in the very heart of the Saint Francis Basin District, Arkansas.

PENROD-JURDEN COMPANY

A Name that Should be on your Enquiry List for both Veneer and Lumber

Mills at Helena and Penjur, Ark. General Offices: Memphis, Tennessee.

Penrod Walnut and Veneer Co.

KANSAS CITY, MO.

Exclusive Manufacturers American Walnut Lumber and Veneers

AMERICAN BLACK WALNUT LUMBER

FAS—6-9¾" Wide, 8-16" Long

3/8"	3,750 Feet
1/2"	21,470 "
5/8"	44,140 "
3/4"	25,962 "
4/4"	82,502 "
5/4"	26,766 "
6/4"	39,201 "
8/4"	33,140 "
10/4"	14,245 "
12/4"	11,470 "
16/4"	3,700 "

FAS—10" and Up Wide, 8-16" Long

1/2"	9,680 Feet
5/8"	18,980 "
3/4"	14,430 "
4/4"	48,872 "
5/4"	14,165 "
6/4"	10,262 "
8/4"	16,920 "
10/4"	10,250 "
12/4"	1,800 "
16/4"	2,100 "

Fas—6"and Up Wide, 6-7 Feet Long

3/8"	1,200 Feet
1/2"	5,790 "
5/8"	840 "
3/4"	8,940 "
4/4"	32,400 "
5/4"	2,300 "
6/4"	7,800 "
8/4"	1,500 "
10/4"	1,400 "
12/4"	500 "
16/4"	400 "

SELECTS

4/4"	32,940 Feet
5/4"	27,530 "
6/4"	21,480 "
8/4"	33,590 "
10/4"	16,850 "
12/4"	6,054 "
16/4"	1,332 "

NO. 1 COMMON

3/8"	8,000 Feet
1/2"	27,380 "
5/8"	29,850 "
3/4"	31,285 "
4/4"	59,675 "
5/4"	38,240 "
6/4"	18,750 "
8/4"	39,240 "
10/4"	16,363 "
12/4"	4,768 "
16/4"	1,604 "

NO. 2 COMMON

3/8"	1,500 Feet
1/2"	1,900 "
5/8"	4,500 "
3/4"	2,190 "
4/4"	72,250 "
5/4"	47,890 "
6/4"	31,720 "
8/4"	35,940 "
10/4"	19,140 "
12/4"	20,116 "
16/4"	16,088 "

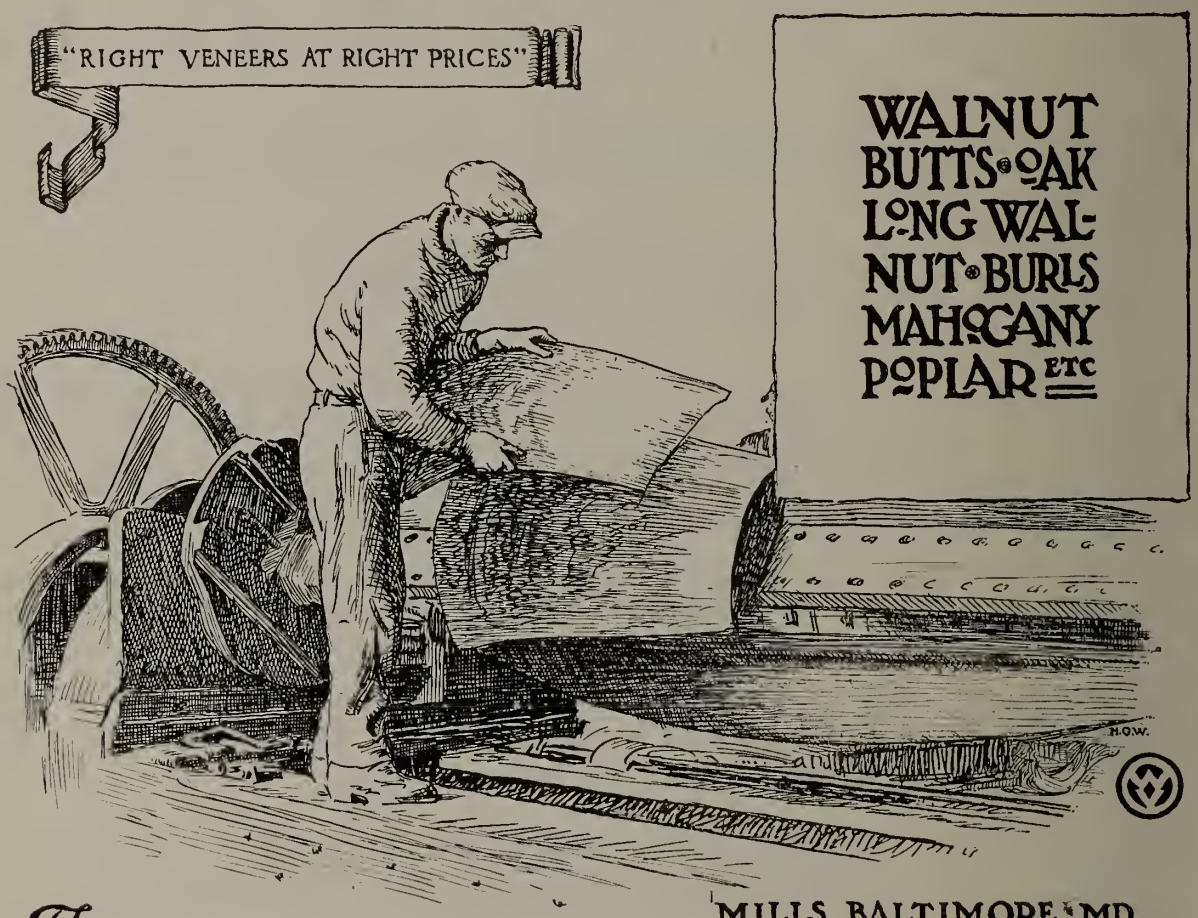
Write for prices on any items you are interested in *"PENROD SERVICE" Satisfies*

C. A. Rugg, 115 Foots Avenue, Jamestown, N. Y., Eastern Representative.

Geo. C. Hall, 610 South Michigan St., Representative for Chicago and Michigan territory.

EXPERTNESS

Our Cutters are highly trained in the art of cutting veneers; careful of surface & thickness



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The
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Evansville transportation service is a consideration in buying veneer.

Seven railroads at our warehouse doors make quick shipment possible.

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Chicago & Eastern Illinois
New York Central
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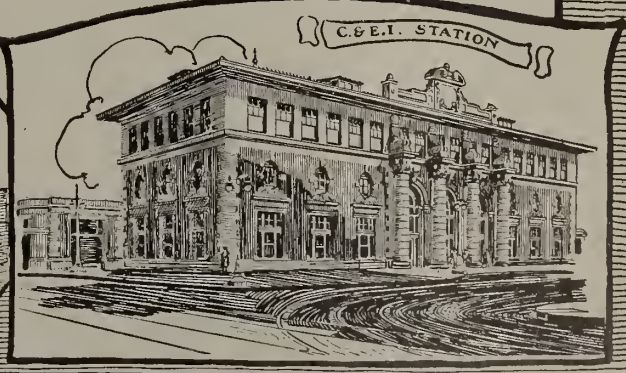
L. H. & St. L.
Evansville & Indianapolis

Our tracing service insures prompt delivery

— Evansville Lines —

Quartered Oak,
Plain Oak,
Plain Walnut,
Figured Gum,
Rotary cut Gum.

THE *Evansville Veneer Co.*
MANUFACTURERS OF
VENEERS.
EVANSVILLE, IND.



Uniform Specifications For Built-Up Panels

Important Step by Plywood Manufacturers—Tend to Eliminate Friction and Misunderstanding—Should Have Far Reaching Effect

At a meeting of Plywood Manufacturers' Association, held recently in Chicago, grading rules covering the various grades of panels, in both plain and figured woods, were brought down and adopted. This is a step in the right direction, as not only will it tend to standardize the products of the different panel plants, but will establish a basis upon which both buyer and seller can settle all disputes which may arise. Other important questions such as cost and freight rates were discussed. It was also decided to join the National Veneer and Panel Manufacturers' Association in their campaign to advertise built-up products.

The rules covering built-up panels are as follows:

FIGURED WOODS

A. A. A.

Applies to figured face veneers, center, butt and pattern matched. Otherwise like "AA."

A. A. (Extra Grade).

Faces

Carefully matched for figure and color.
Veneers clear and free from all defects such as sap, stains, worm holes, sound knots, etc.
Machine sanded, belt finished.
All joints glued.

Face Crossings

One piece, clear stock, tight cut.

Lumber Cores

Mixed lumber core not permissible.
Knots and defects all cut out.
All joints machined and tightly glued.

Rotary Cores

Stock one piece or glue joints clear of defects, smooth and well out.

Back Crossings

Same as face crossings, but more than one piece permitted when jointed and taped.

Reject Backs

Not used in this grade unless requested.

Sound Backs

Jointed veneers with tight joints; veneers not matched for color or grain; burls, pin knots, patches properly made; mineral stains or natural discolorations in live timber not a defect. Scraped or sanded.

A (Standard Top Grade).

Faces

Random figure.
Average matched for color.
Streaks, small stains, sound pin knots allowed.
Scraped or sanded.

Face Crossings

Piecing permitted, properly jointed and taped.

Lumber Cores

Any suitable core wood.
Sound knots, patching and minor defects permissible.
Sawed joints allowed.
Slightly open joint permissible.

Rotary Cores

Piecing permitted, properly jointed and taped.

Back Crossings

Same as face crossings.

Reject Backs

Veneers may have doze, stain, small knots with bark or pith in centers, pinworm holes; end checks; loose or rough cutting. Open joints permitted.

Sound Backs

Jointed veneers with tight joints; veneers not matched for color or grain; burls pin knots, patches properly made; mineral stains or natural discolorations in live timber not a defect. Scraped or sanded.
Standard Top Grade.

PLAIN WOODS

B (Standard Grade)

Faces

Clear veneers, selected and matched for color.
Properly jointed and taped.
Scraped or sanded.
Properly made patches permitted.

Face Crossings

Piecing permitted, properly jointed and taped.

Lumber Cores

Any suitable core wood.
Sound knots, patching and minor defects permissible.
Sawed joints allowed.
Slightly open joints permissible.

Rotary Cores

Piecing permitted, properly jointed and taped.

Back Crossings

Same as face crossings.

Reject Backs

Veneers may have doze, stain, small knots with bark or pith in centers, pinworm holes; end checks; loose or rough cutting. Open joints permitted.

Sound Backs

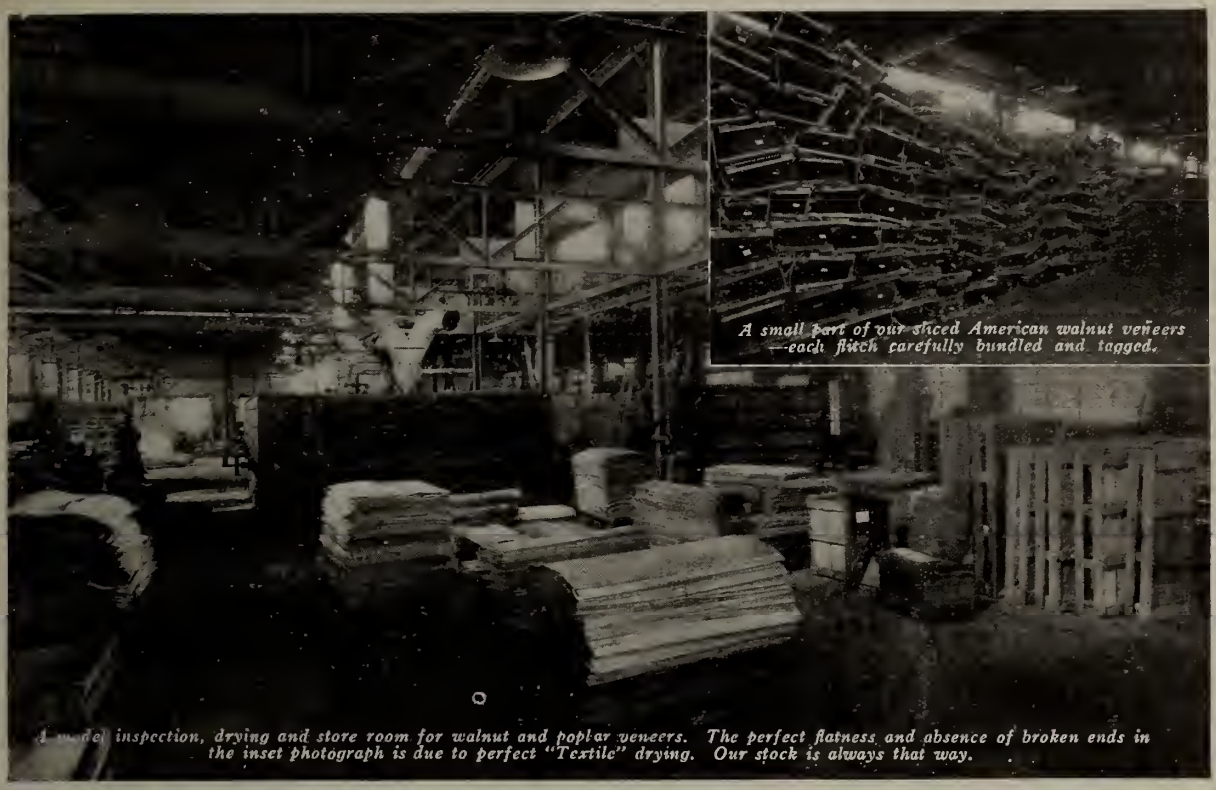
Jointed veneers with tight joints; veneers not matched for color or grain; burls, pin knots, patches

100% EXCELLENCE

Manufacturing
High Grade ROTARY CUT VENEERS
Specializing BIRCH DOOR STOCK,
MAPLE PIANO PIN BLOCK STOCK

Years of Experience Behind Our Products

The Munising Woodenware Co.
MUNISING, MICH.



A small part of our sliced American walnut veneers —each flitch carefully bundled and tagged.

A model inspection, drying and store room for walnut and poplar veneers. The perfect flatness and absence of broken ends in the inset photograph is due to perfect "Textile" drying. Our stock is always that way.

An Always Dependable Product and Service

BECAUSE our organization was built with careful thought to each detail we are able to back up that statement. Each department was carefully planned and organized to get a definite result—a final product of unsurpassed quality. This involves a rigid selection of logs by trained log buyers operating over a wide territory; the most perfect of equipment, and the correct use of each modern machine. The product is then handled as it should be right up to your factory. Our four band mills and three veneer mills manufacture the best obtainable in quartered and plain white oak lumber, sawed quartered oak veneers, walnut lumber and sliced and rotary cut walnut veneers, rotary cut yellow poplar crossbanding and a general line of high-grade southern hardwoods.

WOOD-MOSAIC COMPANY

INCORPORATED

LOUISVILLE, KENTUCKY

Chicago Representative:
GEO. W. STONEMAN & Co.
845 West Erie St.

Grand Rapids Representative:
HECTOR ROBERTSON
232 Lyon St., N. W.

properly made; mineral stains or natural discolorations in live timber not a defect. Scraped or sanded.

C (Exposed Work)

Faces

May contain jointed veneers with tight joints; veneers not matched for color or grain; burls, pin knots, patches properly made; mineral stains or natural discolorations in live timber not a defect.

Scraped and sanded.

Face Crossings

Piecing permitted without jointing or taping.

Lumber Cores

Any suitable core wood.

Sound knots, patching and minor defects permissible.

Sawed joints allowed.

Slightly open joints permissible.

Rotary Cores

Piecing permitted without jointing or taping.

Back Crossings

Same as face crossings.

Reject Backs

Veneers may have doze, stain, small knots with bark or pith in centers; pinworm holes; end checks; loose or rough cutting. Open joints permitted.

Sound Backs

Jointed veneers with tight joints; veneers not matched for color or grain; burls, pin knots, patches properly made; mineral stains or natural discolorations in live timber not a defect.

Scraped or sanded.

D (Semi-Exposed)

Faces

Veneers may have doze, stain, small knots with barks or pith in centers; pinworm holes plugged; closed end checks; lose or rough cutting glued tight.

Slightly open joints permitted.

Scraped or sanded.

Face Crossings

Made in 3 ply only.

Lumber Cores

Not made with lumber cores.

Rotary Cores

Piecing permitted without jointing or taping.

Back Crossings

Made only in 3 ply.

Reject Backs

Veneers may have doze, stain, small knots with bark or pith in centers; pinworm holes; end checks; lose or rough cutting.

Open joints permitted.

Sound Backs

Jointed veneers with tight joints; veneers not matched for color or grain; burls, pin knots, patches properly made; mineral stains or natural discolorations in live timber not a defect.

Scraped or sanded.

Remarks

Used for case and mirror backs; and drawer bottoms where panels are semi-exposed.

D. D. (Concealed Work).

May be of any kind of wood and may contain open joints or checks not over ½ inch wide, 12 inches long or half the length of the panel if under 24 inches long.

Types of Workmen

A study of the strong and weak features of those under him will often assist a foreman in perfecting his organization, improving the efficiency of the men, and securing better results. The following helpful suggestions may be of interest:

The "conceited fellow" works better for compliments, or for a chance to prove himself to the foreman a smarter man than he is.

The "trouble-maker" must be kept busy. The foreman should keep him doing political work for him, instead of political work against him.

The "lay-off pest" needs careful attention. A good way to get at this fellow is to have another man on his job when he returns, then give him something lower down the scale.

The "careless man" should, for the good of shop discipline, be made to pay for his mistakes.

The "thick-headed fellow" should be encouraged as much as possible, to see if there is really anything in him that will come out under coaxing or pressure.

The "quarelsome man" should either be worked alone or put in a gang where it is to the best interest of the firm not to have too much harmony—an excess of this may not be always an advantage, and a foreman can often capitalise even on discontent.

The "slow worker" should especially be taught short cuts, and be given the best possible equipment

The "old men" should be taken care of, but not "babied"; they should be encouraged to think themselves as important as the young blood, but not overloaded.

The "tinker"—the million-idea man—should be given the plainest and most simple of jobs.

The "religious man," the man who is completely carried away with his church, should not be encourged to talk his "shop"; but the foreman should not allow anyone to make sport of him.

The "lazy man" needs a lot of the foreman's help. If he is kept too busy to be lazy, and has often to show results, it will be the foreman's fault if he doesn't throw it off.

The "relative" should be given a good chance to make good, and the foreman should see that he does make good, but must not carry him along on his back if he does not hold his end up. A brother, a son, or some other kin, can sometimes thoughtlessly demoralize any organization.

Basic Cause of Warped Panels

The warping of the panels, whether three or five-ply, is due to the expansion or contraction of the wood, which in turn is caused by the absorption or elimination of moisture. That being the case, moisture may be taken as the root of all warping and twisting. In general terms if warping and twisting is experienced, the cause is that either the panel has not been dried thoroughly and is giving up its moisture or that it has been dried too much and is taking moisture from the air. The former is likely to be the cause in nine cases out of ten, and suggests its own remedy. Another point is that the taking up of moisture from the air tends to release certain strains which have been more or less equalized and which have been resisted by the setting of the dry wood. When released, these strains often cause the panel to warp to a greater degree than the amount of moisture taken up would seem to warrant.

Our best Advertisement is a Trial Order

We have a large stock of American Walnut, Mahogany, Quartered Oak (in all thicknesses) Figured Gum Veneers and Rotary Cut Veneers—all ready to fill your order.

Our products are strictly high grade.

Let us hear from you.

V

We carry in stock, for immediate shipment, 3 and 5 ply Panels in Birch, Oak, and Mahogany — sizes 24" and 30" wide, 48", 60" and 72" long.

Toronto Veneer Co., Ltd.

1100-1104 Queen St. West, TORONTO, ONT.

Walnut, Quartered White Oak and Mahogany Veneers and Lumber

Prompt Delivery

LONG-KNIGHT LUMBER COMPANY

INDIANAPOLIS, IND.

Foreman Says Wages Should Not be Reduced

Outlines Attitude of Mechanic—Increased Production Rather than Lower Wages is Solution—Employer Must Provide Suitable Equipment

By W. G. C.

I notice that the theme of wage reduction has gained considerable impetus lately in many newspapers and trade periodicals, but try as I will, I cannot remember any such agitation amongst manufacturers a few years ago as to how high they could raise wages to meet the ever-increasing cost of living. Now to discuss a few of the questions found on Page 77 of the January 1st "Canadian Woodworker." Should employees shoulder a part of the responsibility by accepting a lower wage? Not yet. Because although we often see in the press about certain reductions in food, clothing, etc., having taken place, yet we very rarely find any reductions in the stores. It has not yet reached the consumer to any appreciable extent. This should be taken cognizance of in any readjustment of wages.

I went into a store yesterday to purchase a bag of flour and was advised to lay in a stock because it was going up. Sugar also in our locality has risen 1c. per lb. Meat has not been reduced at all. If the manufacturers would promise a reduction in living expenses, then I have no doubt that the employee would be content to accept a corresponding decrease in wages. The dollar is not yet what it should be in purchasing power. Why then this outcry concerning a reduction of wages? The inflation period had two years' run before the wages were raised, so why not let the deflation period have a two years' run before wages are reduced. I do not think it would be good policy to alter the wage scale at the present time.

Have Little Effect on Costs

Question 2.—Would it be to the advantage of the workman inasmuch as it might mean steadier work, etc. Notice the word "might." Can or will the manufacturers guarantee that a small reduction will give steadier work? I don't think it would have a very great effect because a 10% reduction in wages does not mean a 10% reduction in the retail price of furniture.

Question 3. How do the rates paid woodworkers compare with those in other industries? Not very good. Take plumbers, $1.00 to $1.25, iron workers 75c. to $1.00, carpenters 90c. to $1.00, clothiers up to $35 per week. Now here in this question is a point of vital importance to manufacturers of wood products. From where is your next generation of woodworkers coming? I am a foreman in a furniture factory and I find it nearly impossible to get youths of any intelligence to come in and learn the trade. Why? Because there is not enough money at the end of it. Why should the woodworking industry pay less than other industries? Do not your mechanics require to have as much technical education or knowledge as other trades? Do they not take as much risk. Are they an inferior kind of workmen or what is the matter that they should get not much more than half the wages paid in other lines of endeavor?

Must Make Calling Attractive

If you want your old mechanics back in the trade, those who quit in war time to go to more remunerative jobs and trades, you will have to pay the money. Let me give you one of the psychological effects that low wages have upon the employee of furniture manufacturers. When wages are so reduced that the employee generally speaking cannot purchase his own products, he gets dissatisfied with his own domestic surroundings. This discontent is reflected in his conduct toward his work. A dissatisfied workman usually turns out unsatisfactory work. If such a man has any ambition, he looks out for something more remunerative, and away goes another mechanic lost to the trade.

Now the furniture industry has not a glut of highly-skilled mechanics that it can play fast and loose with those it has already got, therefore at present I think it would be poor policy to reduce wages.

Another point. If wages were reduced, the employee would have still less money to beautify his home; therefore, what little that would be gained by cheaper production would be lost because he would have no surplus with which to buy.

Aim at Increased Production

On the same page in the January "Canadian Woodworker" a representative Ontario woodworker puts it very cleverly and in a very concise form, viz., "We feel sure that where an inquiry in sympathy with decent requirements is made, it will be shown quite plainly that those engaged in the woodworking industry are not receiving much, if any more, than what is generally termed a 'living wage.'" I fully endorse that sentiment and here is another thought for those to consider who call for mutual co-operation and understanding between employer and employee. Why should an employee be ground down to a living wage? There has been too much said about a living wage. Is that all a man should receive? Just enough bread and butter and no more? Should he not be allowed to give his children a better education than he himself had? I think if more stress was laid upon cheaper production and increased efficiency of both men, plant and methods instead of wage reductions, that in the end the same object would be achieved. Let the manufacturers give the mechanics a chance by providing the best possible tools to work with. Then he has a right to demand more production and greater effectiveness.

Wood Pipes in South Africa

A firm in South Africa is manufacturing wood pipe from California redwood, 2½ in. to 20 in. in diameter. These pipes are used for pressures up to 170 lbs.; they are durable and cheap, have a low co-efficient of friction, and are light and easy to transport, a great consideration in South Africa. Pipes over 20 in. are built in situ, and instead of being machine-wrapt or bound with wire, as are the smaller sizes, they are bound with heavy steel bands. When one considers that the old wooden water pipes of London, of which it is said there were 400 miles laid, lasted in use for two centuries, there is no reason why better finished, if lighter, stave pipes should not be serviceable, especially for temporary use, for irrigation on farms. The makers claim that they are from 50 per cent. to 70 per cent. cheaper than any other class of pipe.

MANUFACTURER
OF
PLAIN AND QUARTERED
SOFT KENTUCKY RIVER OAK
MOUNTAIN POPLAR
WALNUT
ASH

LELAND G. BANNING
CINCINNATI, OHIO

Canadian Representative:
A. E. KLIPPERT,
11 LAXTON AVE.,
TORONTO, ONT.

MILL:
FRANKFORT, KY.

1897 1853 1921

Veneered Panels

Ready for quick shipment in following veneers

Walnut, Plain Oak, Birch, Quartered Oak, Mahogany, and Maple.

3 Ply—1/4" thick and 5 Ply—3/8" thick.
Sizes—72 x 24, 60 x 30, 60 x 24, 56 x 25, 60 x 20, 60 x 18, 48 x 18.
also in quantities cut to size for
PHONOGRAPH CABINETS, FURNITURE DRAWER BOTTOMS, ETC.

Hay & Co., Ltd.

Woodstock, Ontario

The Lumber Market

Domestic Woods

The general improvement which is noticeable in certain of the woodusing industries has not as yet made itself felt in the lumber field. At the present time the demand for Canadian hard and soft woods is slack. It was felt that as business improved in the allied industries there would be a marked improvement in the call for lumber. This has not as yet materialized. If, however, the wood-using industries are operating, and they are, though at reduced capacities, a certain quantity of wood is being remanufactured, which means that some must be purchased in the near future to replenish the fast diminishing stocks. The February "Canadian Woodworker" contained a few prices furnished by a leading hardwood dealer, which gave his idea of the values which were current on the Toronto market. Another large wholesaler has submitted the following list as being his idea of present-day values:

4/4 Birch F.A.S.	$110.00
4/4 Birch No. 1 C. & Sel.	75.00
4/4 Birch No. 2 C.	45.00
5/4 & 6/4 Birch F.A.S.	115.00
5/4 & Birch No. 1 C.	80.00
5/4 & 6/4 Birch No. 2 C.	55.00
8/4 Birch F.A.S.	125.00
8/4 Birch No. 1 C.	90.00
8/4 Birch No. 2 C.	60.00
10/4 & 12/4 Birch F.A.S.	130.00
11/4 & 12/4 Birch No. 1 C—Sel.	105.00
10/4 & 12/4 Birch No. 2 C.	70.00
16/4 Birch F.A.S.	145.00
16/4 Birch No. 1 C.	105.00
16/4 Birch No. 2 C.	90.00

Maple prices would average from $5.00 to $10.00 lower than the above.

These figures are, with one exception, lower than those presented last month and as there has not been any drop in hardwood values, it goes to show that there is not any recognized level of prices.

Regarding operating conditions in the woods and the cost of logging, one well-known softwood wholesaler remarked that, owing to the absence of snow and cold weather hauling facilities had been unfavorable. Many teams had gone through the thin ice on open rivers. There was a danger, too, in view of the limited precipitation of snow that there would be driving difficulties in the spring owing to low water in the lakes and streams. Referring to decreased production during the present season, he estimated that in Northern Ontario the cut of white pine would be reduced by fifteen per cent. from last season; red pine, thirty per cent.; spruce, thirty-five per cent., and hemlock, twenty per cent. With respect to values, he believed that white pine would hold its own, and that practically the same prices would prevail as in 1920, with the exception of those on mill culls and dead culls, which might go very low. Red pine also would in all likelihood show a decline in values as well as spruce, of which there was a considerable quantity on the market, especially in the east. In hemlock, which was the principal lumber used for studding and other purposes in house construction, there had been a runaway market in 1920 and the price had dropped today about thirty per cent. He did not look for a change in quotations on hemlock of more than two or three dollars a thousand. In the west there had been a considerable reduction in the figure for logs, particularly in cedar and fir. On the former prices, which had during the war ranged from $25 to $40, had now declined to $15 and $25. The lumber market should be watched closely for a slight increase in demand will result in higher prices.

Imported Woods

The anticipated increase in the demand for American hardwods is still an immediate probability. Indications point to a gradual resumption of buying but at the present writing the market is very quiet. Certain of the wood-using industries, such as the furniture and automobile, are resuming operations on a limited scale, but seemingly have not found it necessary to enter the market for lumber. A distinctly optimistic tone pervades most of the American producing centres, for inquiries have been more plentiful during the last few weeks. While few of these have resulted in sales, yet the feeling is that certain industries cannot remain out of the market for very much longer. One thing is certain and that each passing month brings us that much nearer the time when buying will become more general. As all indications point to higher values as the demand increases, the woodworker who finds his stocks running low, is taking a chance when he puts off buying. He may find that he could have bought to advantage today rather than a month or two later. Most of the stocks of oak, walnut, gum, etc., are in strong hands and as present prices are at and even below the cost of production, it does not seem reasonable to expect prices to drop much further. If that is true and higher values are a possibility, the present would appear to be the logical time in which to buy. Production is low, stocks are being slowly depleted and broken up, which makes it appear that a shortage is probable in the near future. Should that occur, a mild scramble for lumber will be the inevitable result.

Mid-West Wood Turners Organize

The Charter Convention of the Mid-West Association of Wood Turners was held at Congress Hotel, Chicago, February 15th. This association is a newly organized branch of the National Association of Wood Turners.

The Convention completed the formation of the Mid-West Association, adopted Constitution and elected the following officers for the ensuing year:—President, G. S. Milhan, The J. B. Hellenberg Co., Coldwater, Mich.; Vice-President J. F. Strombeck, Strombeck-Becker Mfg. Co., Moline, Ill.; Treasurer L. A. Walker, Stephenson Mfg. Co., South Bend, Ind.; Secretary F. S. Upham, American Handle & Novelty Co., Des Moines, Ia.

The meeting was addressed by such speakers as Wm. B. Baker, Secretary of the Association of Wood Using Industries and of the National Chair Manufacturers' Association; by Wm. A. Babbitt, General Secretary of the National Association of Wood Turners and Chairman of the National Standardization Committee of the A.W.U.I., and Austin F. Hawes, forestry expert, Forester of the National Association of Wood Turners.

Canadian Hardwoods

Good Stocks
Right Grades
Prompt Shipments

: Members National Hardwood Lumber Association ::

Crating
of all descriptions

C. A. Spencer, Limited
Merchants and Manufacturers
McGILL BUILDING - MONTREAL

We Manufacture
a complete line of

Chair, Cane-Cutting
and
Bending Machines

CUTS AND CATALOG
UPON REQUEST

L. G. McKnight & Son Co.
GARDNER, MASS.

Canadian Hardwoods
for
Canadian Consumers

4	Cars	4/4″	No. 2 Com. & Btr. Basswood
3	"	5/4″	No. 2 Com. & Btr. Basswood
1	"	6/4″	No. 2 Com. & Btr. Basswood
1	"	8/4″	No. 3 Com. & Btr. Basswood
1	"	8/4″	No. 3 Com. & Btr. White Ash
3	"	4/4″	No. 3 Com. & Btr. Soft Elm
1	"	8/4″	No. 2 Com. & Btr. Soft Elm
2	"	12/4″	No. 1 Com. & Btr. Soft Elm
5	"	4/4″	Com. & Btr. Hard Maple
3	"	8/4″	Com. & Btr. Hard Maple
2	"	12/4″	No. 1 Com. & B. Hard Maple

What will you have, please?

Canadian General Lumber Company, Limited
712 Bank of Hamilton Bldg.
TORONTO
MONTREAL OFFICE: 203 McGill Bldg.

Selling
Graves, Bigwood & Co.'s
Lumber, Lath and Box Shooks

Information and Inquiries

You are cordially invited to make use of this department

Whole List of Questions

Calgary, Alta., March 3rd, 1921.

Editor, Canadian Woodworker:—

Will you kindly enlighten me on the following points:—

1. In your October issue, 1918, you gave a formula for standard fumed oak stain. Where can I get the necessary ingredients?

2. In an article in the October issue, 1920, a reference was made to a new process fuming liquid. Will you give me the name of the maker of this material?

3. Can you inform me what are the average quantities of the different grades produced from 1000 feet of Western pine log, with particular reference to such grades as clear, shop, No. 1 common and No. 2 common?

4. Would also like some information pertaining to the Millwork Cost Information Bureau. What is it? Can I join it? What are the dues, etc.?

Your kind compliance with this request will be appreciated.

Yours truly,
James Wright.

1. The materials required for making fuming stain can be secured from any of the manufacturers of finishing material who advertise in the "Canadian Woodworker," such as Adams & Elting Co., Toronto, Ont.; Marietta Paint & Color Co., Marietta, Ohio; Edward J. Shannon Co., Cincinnati, Ohio, and the Standard Paint & Varnish Co., Limited, Windsor, Ont.

2. The new process fuming liquid to which reference was made in the October "Canadian Woodworker," is manufactured by the Adams & Elting Co., Chicago and Toronto.

3. We have not any information pertaining to the quantities of the different grades of lumber produced from Western pine logs. In all probability I. R. Poole, secretary of the Canadian Lumber Manufacturers' Association, Nelson, B.C., will be able to give you some information on this point.

4. The Millwork Cost Information Bureau, Chicago, is an association of woodworkers who have got together and worked out an efficient cost-finding and estimating system for woodworking plants. If you will write W. P. Flint, secretary, 11 South La Salle St., Chicago, he will be pleased to give you full information.

What Causes These Pinholes?

A manufacturer of pianos is experiencing a considerable amount of trouble from pinholes and would like to have some of the readers of the "Canadian Woodworker" come to his assistance by suggesting how this objectionable feature may be overcome. The most peculiar feature of the problem is that the pinholes are to be found only on the underside of the piano tops. The work is all handled uniformly as far as is known and follows the usual procedure of staining, filling, etc. The varnish coats, with the exception of a final flowing coat, are applied by spray. What is the probable cause for these pinholes and why are they found only on one side of the tops? What is your idea?

Movement for Clock

Horseheade, N.Y., March 7th, 1921.

Editor, "Canadian Woodworker":—

Will you kindly tell me where I can secure a heavy English movement with brass dial for a hall clock. I would like to secure this complete ready for insertion in the case.

Yours truly,
F. L. Warner.

We understand that the Waltham Watch Co. make movements which are suitable for grandfather's clocks. If they are not in a position to fill your order, would suggest that you get in touch with Hirst Bros. & Co., Limited, Oldham, near Manchester, England.

Market for Wood Waste

An English manufacturer is in the market for quantities of birch squares 1⅛ in. x 1⅛ x 3 in. and ⅞ x ⅞ x 3 in. This stock might be cut from trim-saw blocks and edgings. If interested, write for name. Inquiry, 2784.

Maple Flooring Wanted

A firm in Manchester, England, are desirous of securing a large quantity of maple flooring and would like to get in touch with manufacturers or exporters who are in a position to handle overseas business. Name of above firm may be secured on application. Inquiry, 2738.

Spruce, Pine and Basswood Squares

A British concern is in the market for a quantity of spruce, pine or basswood strips 1⅛ in. x 1⅛ in. x 48 in.., tied in bundles of 30. The name of this firm will be furnished on request. Inquiry, 2783.

Be Careful About Minor Injuries

By Dr. Geo. G. O'Connell

The advisability of having all minor injuries promptly attended to cannot be too strongly emphasized. As, "From little acorns mighty oaks do grow," —so also from little cuts and scratches many bad infections arise.

With the proper medical attention given to minor injuries practically all of them heal without the formation of pus. When they are not attended, and infection or pus sets in, the healing of the wound is usually prolonged two or three times as long as it would have been had no infection resulted.

Aside from the physical pain and discomfort resulting from infection, there is to be considered the possibility of prolonged inability to carry on one's occupation with the consequent economic loss to both the employee and employer. It is to be again strongly advised that all employees immediately report all injuries, no matter how slight or insignificant they may seem.

The Mark of Conservative Merit

It is purposed that this advertisement shall carry a message of understandable value to executives in wood-using factories everywhere. In general, reputation comes when, through long years of painstaking growth, merit in goods and courtesy in service have remained supreme over many disheartening experiences. The fact, therefore, that a sound reputation has been established is, per se, evidence of unwavering cleavage to correct business principles. The successful executive will understand that. Because we can without boasting claim to have reached that position, we hope our advice to buyers of southern hardwood lumber, veneers and panels may be heeded. Our counsel "BUY NOW" is sponsored by a long record of constructive thought. Don't overload—don't speculate—but cover your next few months' needs.

The ANDERSON-TULLY CO.

Fine Hardwoods

MEMPHIS

News of the Trade

The Kiddie-Koop Mfg. Co., of Toronto, was registered recently.

S. Oakes, Strathroy, Ont., has started work on a new planing mill.

The Montreal Woodworking Co., Montreal, P.Q., was recently registered.

Western Upholstering Co., London, Ont., recently suffered a loss by fire.

R. H. Pugh, London, Ont., upholsterer, recently sustained a loss by fire.

The Winchester Repeating Arms Co. are contemplating erecting a plant in Canada.

The Spruce Falls Co., Kapuskasing, Ont., are erecting and equipping a planing mill.

H. A. Johnston, 412 Lake Front, Toronto, contemplates erecting 25 bungalows in North Toronto.

Richard A. Saunders, Carleton Place, Ont., has commenced the construction of a new planing mill.

Hardy Cooperage Co., Annapolis, N.S., was recently registered with N. Hardy and J. G. Hardy as partners.

Chas. E. Farrar & Sons, Greenfield Park, P.Q., were recently registered as upholsterers, with Chas. E. Farrar proprietor.

Curley & Buchanan, Dunham, P.Q., were recently registered as manufacturers of sash, doors and other forms of woodwork.

The sash and door factory of John East Co., Fort Frances, Ont., has been disposed of and will be converted into a steam laundry.

La Cie de Pianos and de Phonographes, St. Angelle de Laval, P.Q., was recently registered with J. A. Falandeau as proprietor.

The total pay roll disbursements of 51 Grand Rapids furniture factories is given as $14,697,070 for 1920, as against $10,418,815 for 1919.

The Quebec Paint and Varnish Co., Limited, Brantford, Ont., have been incorporated to manufacture a complete line of paints and varnishes.

The High Point furniture manufacturers contemplate holding an exhibition in the new furniture exposition building from May 1st to May 15th.

Certain changes have been made in the organization of the Continental Upholstering Co., Montreal, P.Q. M. H. Cohen is now the registered proprietor.

The Interior Hardwood Co., Limited, Kitchener, Ont., were recently authorized by supplementary letters patent to increase their capital from $40,000 to the sum of $300,000.

The Brown Bros. Co., 11 Broadway, New York City, offer in their advertisement in this issue a quantity of high-graded white hickory of various sizes for immediate shipment.

Industrial Products Limited, Toronto, were recently incorporated to manufacture and deal in all kinds of varnishes, japans, enamels and other finishing materials. Capital, $40,000.

J. E. L. Streight of Islington, Ont., has disposed of his planing mill and lumber yard to the Irvin Lumber Co., Toronto. It will be conducted as a branch yard by the latter concern.

The Holland Varnish Company, Limited, Montreal, were recently incorporated to manufacture and deal in varnishes, stains, polishes and other similar ingredients. Capital, $1,000,000.

The planing mill of McKenzie & Graham, Bible Hill, N.S., was destroyed by fire recently. The loss runs in the neighborhood of $40,000. The company is undecided as to its future plans.

A. E. Taylor, Hull, P.Q., has secured the Canadian rights for a well-known line of storage batteries, and contemplates securing a factory and installing equipment to handle this line.

As a sign of the times the fact that the Ford Motor Company of Canada, Ford, Ont., has reached capacity production, 225 cars per day, on a four-day-a-week schedule, is not without its significance. The assistant general manager, W. Campbell, says: "Our business is picking up in a remarkable manner, and we expect to have the factory strained to its production limit within a short time."

A survey of the furniture industries in Chicago and Grand Rapids reveals the fact that the average hourly wage in the former city is 60.3c. per hour, while 61.4c. is the prevailing rate in Grand Rapids.

Burdette & Valede, 33 St. James St., Montreal, manufacturers of soda fountains and fixtures, contemplate moving to larger premises in the near future. They are in the market for a planer and band saw.

Sanator, Limited, Montreal, P.Q., was recently incorporated to manufacture and deal in boxes, baskets and wooden containers. Capital $350,000. N. Morrissette and J. H. Petit, both of Montreal, are two of the incorporators.

J. C. Giroux, Limitee, Montreal, P.Q., was recently granted a provincial charter to manufacture and deal in all kinds of office and household furniture. Capital $20,000. J. C. Giroux and G. E. Dubuc, both of Montreal, are two of the incorporators.

Canadian Automobile Corporation, Montreal, P.Q., have been incorporated to manufacture and deal in automobiles, aeroplanes, and other wooden vehicles. Capital $600,000. Two of the incorporators are G. McTeigue and A. Mathieu, both of Montreal.

The large munition plant at Leaside, Ont., which was erected by the American Government at a cost of $8,000,000, has been taken over by the Leaside Munitions Co., Limited. It is the intention of the new owners to use this plant for manufacturing purposes.

The Canada Wood Specialty Co., Orillia, Ont., manufacturers of dowels, handles, etc., are adding a third electric enamel baking oven for baking the finish on enamelled handles. These ovens are manufactured by the Purdy Co., Limited, Oshawa, Ont.

The planing mill of S. L. Lambert, Welland, Ont., was recently destroyed by fire. The loss, which amounts to $30,000, is only partially covered by insurance. Defective wiring is given as the cause of the blaze. Mr. Lambert is not decided as to his future plans.

The W. E. Harris Manufacturing Co., Limited, Toronto, was recently incorporated as planing mill operators and manufacturers and dealers in wood products. Capital $25,000. J. F. Lucas and C. McKay, barristers, both of Toronto, are two of the incorporators.

Clarke Bros., Limited, Bear River, N.S., contemplate erecting a box factory in connection with their plant at Glenn Falls, N.B. This new factory will cost in the neighborhood of $25,000. It is expected that work on this new edition will be commenced in the near future.

A provincial charter has been granted T. H. Hancock, Limited, woodworkers and lumber dealers, Toronto, with a capital stock of $1,000,000. Mr. Hancock recently completed one of the finest and most attractive lumber offices in Canada at 1372 Bloor St. W., Toronto.

Canadian Stewart Wire Wheel Company, Limited, Montreal, P.Q., was recently incorporated to manufacture and deal in motor trucks, aeroplanes, and all kinds of wheels. Capital $300,000. Y. Ducharme and G. McTeigue, both of Montreal, are two of the incorporators.

The Celluloid Zapon Co., New York, have opened an office at 520 Walnut St., Philadelphia, Pa., with B. O. Clausen in charge. This company manufacture such lines as lacquer enamels, lacquers and varnishes, bronze liquids, and leather cloth in different shades and types.

W. L. Anderson was recently appointed general manager of the National Shipbuilding Co., Limited, of Goderich, Ont. He takes up his duties immediately. Mr. Anderson has been connected with the Sturtevant Co. of Galt, and was for several years with Messrs. Goldie & McCulloch.

Langslow, Limited, Cobourg, Ont., who recently opened a new factory in Cobourg to manufacture school, office and home furniture, have presented the public school board of that town with 30 Moulthrop moveable and adjustable chair desks. This generous gift was greatly appreciated.

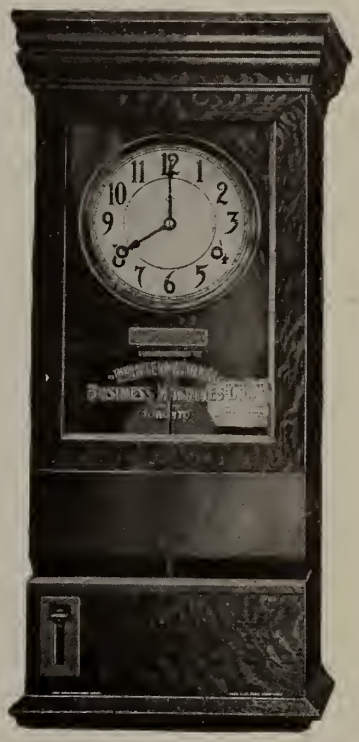
The Radford-Wright Co., Limited, Winnipeg, have under construction a large addition to their sash and door factory. When completed, their plant will be one of the largest and most up-to-date in western Canada. Several woodworking machines of the very latest type are being installed.

The office of L. L. Brown, B. C. Lumber Commissioner for Eastern Canada, was recently damaged by fire. The blaze

How much time is wasted between the factory entrance and work-bench ?

Although your workmen may enter your factory on time, do they **start work on time?** How much time is wasted between these two points in **your** factory? And how much time is lost between jobs? This is a factor in your manufacturing costs that may be greatly affecting the selling price of your products—**unjustly.**

International Time Recorders and Job Time Recorders will enable you to arrive at the exact amount and to reduce it to a minimum. The exact time each workman enters the factory is registered by the International Time Recorder. The exact time that same workman starts **productive** work is registered by the International Job Time Recorder. Then you have an accurate, unchangeable and indisputable record of the labor time you buy as a whole and the labor time that is actually productive.



It's worth some thought, isn't it? Would you like to have more interesting facts about it? We will gladly send them.

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Also manufacturers of Dayton Scales and Hollerith Electric Tabulators

International Time and Job Time Recorders will tell you

broke out in the kitchen of the Sheffield Lunch, which adjoins the lumber commissioners office and worked its way through into the latter office. Repairs are now being made.

The McGill-Quinn Handicrafts Products Co., Norwood, Ont., have inaugurated a direct-to-consumer sales policy. This firm is devoting their attention largely to floor lamps, but with the completion of their new factory, which will be at an early date, they propose to make a full line of wicker furniture.

The Gunn-Son-Ola Talking Machine Co., who took over the plant of the Walker-Clegg Co., Wingham, Ont., early last fall, have reorganized their factory and are putting their line of Gunn-Son-O'a phonographs on the market. Six different styles are being manufactured in such woods as oak, walnut and mahogany

The Hayes Wheel Company of Canada, Limited, Chatham, Ont., are taking on men and expect shortly to be running at full capacity. Owing to general conditions they have been operating at reduced capacity, but the brighter prospects which have opened up are so encouraging that operations are being extended.

The twenty-second annual convention of the National Association of Box Manufacturers will be held in the Florentine Room of the Congress Hotel, Chicago, Ill., on Wednesday, Thursday and Friday, April 6th, 7th and 8th, 1921. A cordial invitation is extended to all box manufacturers to attend this convention.

S. R. Rudd, of Arnprior, Ont., has taken into partnership J. H. McLean of Montreal. The firm will hereafter be known as the Arnprior Lumber & Construction Co. and particular attention will be devoted to the development of the planing mill business, the retail lumber trade and building. New equipment is being installed.

The plant of the Harris Wood Products Co., Streetsville, Ont., is to be put in operation under a new directorate. It will be remembered that this concern, which was organized last spring to manufacture a line of sectional houses, went into liquidation early in the fall. The new plans call for doors and sashes as the principal product.

At a general meeting of the shareholders of the Ideal Cabinets, Limited, Toronto, manufacturers of the Ideal Phonograph, the following officials were elected for the ensuing year: R. A. Stevenson, president; W. N. Martin, secretary-treasurer, and the above gentlemen with H. B. Kautzman and W. H. Lantz, comprise the directorate.

Elgin Handles, Limited, St. Thomas, Ont., have been granted provincial incorporation to take over the concern known as The Elgin Handle Company, and to manufacture and deal in wooden handles and other wood products. Capital, $60,000. G. P. Smith and C. E. Lewis, manufacturers, both of St. Thomas, Ont., are two of the incorporators.

The Electric Phonograph Company of Canada, Limited, Toronto, was recently incorporated to manufacture and deal in phonographs and musical instruments and to secure patents, manufacturing rights, etc., from the Automatic Products Co., Cleveland, Ohio. Capital $250,000. H. H. Gordon and J. D. Spellen, barristers, are two of the incorporators.

At a recent meeting of the Grand Rapids Market Association it was decided that the July furniture exhibitions to be held in that city will be of four weeks' duration instead of the usual three weeks' show. The reasons for this change are that a larger number of buyers usually attend the midsummer exhibition than visit the winter display, and also that a greater effort will be made this year to induce buyers to visit the market.

The plant of McFarlane Douglas Co., Limited, Ottawa, Ont., was recently damaged to the extent of $12,000 by fire. The blaze started from an explosion in a bale of cotton due to spontaneous combustion and spread rapidly to the steel door section and finishing department. The blaze was confined to these two departments by the automatic fire door which separated the woodworking department from the rest of the plant. Had the fire succeeded in reaching this latter department, a disastrous fire would have resulted.

The Office Specialty Mfg. Co., Limited, of Newmarket, recently held their annual sales convention in Toronto. In reviewing 1920 Mr. Slemin, the managing-director, stated that their progress had been phenomenal and that they had never fallen back a single month. This is very gratifying because conditions during the last six months were unfavorable to a large volume of business. An indication of the growth and development of this company is the statement that their business has been increased three and a half times in the space of four years. Branch managers from the different districts were in attendance together with a delegation from the associated company in Rochester, N.Y.

The North American Furniture Co., Limited, and the Owen Sound Chair Co., Limited, Owen Sound, Ont., recently put into effect a readjustment in wages. This was found necessary owing to the fact that substantial reductions have been made in the lines manufactured. A shop committee has also been organized in the North American plant, which consists of five employees selected by their fellow workmen and the five foremen. This committee will meet the management at least every two weeks and take up such matters as production, safety welfare, etc. This should result in strengthening the bond between management and employee as well as improving the organization as a whole.

The Canadian Phonograph Manufacturers' Association recently held their annual meeting at the National Club, Toronto. The officers elected for 1921 are as follows: W. B. Puckett, president; E. C. Scythes, vice-president; W. M. Martin, treasurer; J. G. Merrick, secretary; Export Committee, S. J. Cook, O. C. Dorian, O. Wagner; Exhibition Committee: J. D. Ford, D. A. Trestrail, A. E. Landon; Finance Committee: D. R. Gourlay, Thomas Nash and E. Van Gelder; Legislation and Tarriff Committee: A. Heintzman, J. E. Hoare, W. D. Stevenson; Nominating Committee: J. D. Ford, W. B. Puckett, D. M. Wright. The Executive Committee consists of the elected officers, together with the chairman of each of the standing committees.

The New York State College of Forestry at Syracuse, N.Y., is conducting a three-weeks' course in dry kiln. The instruction consists of a series of lectures and actual practice in operating a dry kiln, grading lumber, identifying woods and other subjects of a like nature. Arrangements have been made for representatives of some of the large lumber manufacturers, dry kiln experts, experienced graders, etc., to be present and take part in the programme. Thus the instruction to be given by the experts in the college will be supplemented by the practical experience of men from the different plants. The number of students are limited to 25, insuring personal instruction. Two of the experts of the Grand Rapids Dry Kiln Co., Grand Rapids, Mich., are delivering a series of lectures.

In February "Canadian Woodworker" a reference was made to the box plant that the Canadian Libbey-Owens Sheet Glass Co., contemplate installing in their Hamilton plant. In error the address of the above firm was given as "Toronto" instead of "Hamilton." The Canadian Libbey-Owens Sheet Glass Co., is the Canadian branch of the American Libby-Owens Sheet Glass Co., of Charlston, W. Va. At the present time work is proceeding on their large factory at Hamilton. It is in connection with this new plant that they propose installing sufficient box-making equipment to enable them to take care of their own requirements. They are in the market for the necessary machines. J. W. Hobbs of the Consolidated Plate Glass Co., Toronto, is vice-president of the Libbey-Owens Co.

The oak screen, which is to flank the speaker's chair in the House of Commons, Ottawa, recently arrived from England and has been installed in place. The new chair, which is also coming from England, is not expected to arrive until early in the spring. This chair is a magnificent piece of work, 13 feet, 6 inches in heighth. It is elevated on two platforms each embellished with deeply sunk quatrefoil tracery. Old oak beams from the roof of Westminster Hall provided the wood for the projecting canopy, in the centre of which the royal arms are carved in bold relief. On the main panel behind and above the seat is the royal mace and sceptre in a design of conventional oak foliage. This chair is a replica of the speaker's chair in the British House of Commons and has been constructed with the strictest fidelity to the original model, each intricate moulding and even the jointing having been followed exactly. The sculptors and carvers worked from plaster casts and photographs so that the work would not vary in the minutest detail. It is hoped that the speaker of the British House will be able to visit Ottawa and make the formal presentation.

Personal

C. O. Maus, of the Hyde Lumber Co., South Bend, Ind., was a recent caller on the trade in Toronto.

F. C. Marquis, who has large interests in the woodworking and allied fields, was recently honored by his business associates in commemoration of his sixtieth birthday. Mr. George Cantin, manager of the Victoriaville Furniture Co.,

One reason why our Gum is Straight and Flat

Do You Know

"That you can get Gum Lumber that is **free from stain and as bright as a dollar?**

"Always thought the sap part of Gum must be discolored, didn't you? Some boards black, some a lighter shade, a few bright—**all lacking uniformity?**

"Oh! of course, the inspection rules say "stained sap is no defect," **but what do you say Mr. Manufacturer,** you who have to **cut up, work and finish the lumber?**

"We have never believed that a manufacturer of furniture, trim, finish, etc., could satisfactorily use Gum lumber in the shape it is generally put out, and we, therefore, set out to **eliminate** the **objectionable features** we have mentioned.

"Have we succeeded? **Unqualifiedly yes.** Nothing left to chance, **no guess work.**

"Every board of our KRAETZER-CURED Sap or Quarter Sawn Unselected Gum **is bright,** with a slight pinkish tinge closely resembling cherry, and **uniform throughout.**

"And it's straight and flat too, **that's another thing we've done.**

"Get acquainted with our kind, **you'll never be satisfied with the other kind again.**

"Costs only a little more in the beginning and **the final cost is less, very much less** and oh! the **satisfaction, the freedom from trouble and worry.**

"Don't be deceived by misrepresentations. Insist on the genuine. Every board bears our trade mark.

Our protection THE KRAETZER-CURED LUMBER CO. *Your guarantee*

The Kraetzer-Cured Lumber Co.

GENERAL OFFICE: GREENWOOD, MISS.

Band Mills: Greenwood, Miss., Moorhead, Miss.

Why our Gum does not stain

Our Quartered and Plain Red and White Oak, Ash, Hickory, Red Gum and Tupelo are as fine as the highest quality of virgin timber and thorough knowledge of production can produce. THERE IS NONE BETTER.

The Sidmans!

We wish to call your attention to our AUTOMATIC SUCTION SYSTEM for returning ALL condensation DIRECT to the Boiler.

Made up of a Condensing Pump Governor and Receiver, and any make of Brass Fitted Boiler Feed Pump, either steam or electric driven.

First cost from, 40% to 65% less than any other system. 15% to 30% cheaper to operate, and 60% to 80% less for repairs.

Suitable for either old or new plants. Satisfaction guaranteed in every case. Ask ANY USER.

Edw. D. Sidman
Our Consulting Engineer

We can also supply you with any Steam Specialty desired, and our own make of Du-o-fold and Three Ply Curtains.

The Sidmans of Canada

Designers of
The Sidman Lumber Curing Kiln

LONDON CANADA

thanked Mr. Marquis in the name of the employees of this firm for the valuable support he had given this organization.

W. R. Elliott, of the Pacific Box Co., Limited, Vancouver, B.C., spent a few days in Toronto recently calling on the trade.

R. A. Laidlaw, of the Laidlaw Lumber Co., Toronto, has been appointed one of the two new trustees who recently were added to the board of directors of the Hospital for Sick Children.

E. M. Stewart, of Robert Stewart, Limited, woodworkers and lumber dealers, Guelph, Ont., recently returned from a trip to British Columbia. While there he gathered facts and information concerning the B.C. lumber situation.

Obituary

Joseph Dufour, carriage manufacturer, Ottawa, Ont., recently passed away in that city.

The death of J. J. Hawkey recently occurred at Parkhill, Ont. Mr. Hawkey was a well-known carriage maker.

George Y. Chown recently passed away at his home in Kingston, Ont. Mr. Chown was interested in various enterprises, being president of the Weber Piano Co., Kingston, as well as having an interest in a Montreal paint and varnish plant.

J. A. Cole, recently passed away at his home at North Bay, Ont. He was a well known woodworker and manufacturer, having been with J. R. Eaton & Sons of Orillia, Ont., for 25 years, later operating a planing mill of his own in North Bay. More recently he was with the A. J. Young Lumber Co., North Bay, Ont.

New Books, Catalogues, Etc.

The E. C. Atkins & Co., Inc., of Hamilton, Ont., have issued a revised price list as a supplement to their catalogue No. 18. This new list cancels all lists on pages 26 to 64, 77 to 85 and 93 to 95 in the above catalogue, and also cancels all former lists.

A new and revised edition of "Kiln Drying of Lumber," by H. D. Tieman, has just come to hand. This is the third edition of this valuable work on the artificial seasoning of lumber. The subject is covered in a very thorough and instructive manner and a vast amount of practical and technical information is given in a clear concise manner. The work is illustrated with over 50 engravings, together with a number of plates. The headings of the different chapters will probably give the best outline of the scope of this book; "The Structure and Properties of Wood;" "Common Practice in Drying;" "How Wood Dries; Shrinkage, Warping Case-hardening;" "The Principles of Kiln Drying;" "Circulation and Method of Piling;" "Special Problems in Drying;" "Improved Waterspray Dry Kiln;" "Drying by Superheated Steam;" "Theoretical Considerations and Calculations;" "Effect of Different Methods of Drying;" "Instruments Used in Dry Kiln Work;" "Temperatures and Humidities for Various Kinds of Lumber;" "Humidity Diagram."

The artificial seasoning of lumber is one of the most important operations in and around the woodworking plant, and the information contained in this book should be of real, practical value and application to every woodworker operating a dry kiln. This work is published by J. P. Lippincott Co., Philadelphia, Pa. Copies may be secured from the publishers of the "Canadian Woodworker." Price $5.00.

The 1920 year book of the National Association of Cost Accountants, which has just been published is an attractive volume which ought to prove of real value to all men interested in cost work. In addition to the reports of the various officers and committees and a list of the members of the Association, it contains a complete report of all papers delivered at the Annual Convention at Atlantic City, together with the discussions which followed each of these papers. This section contains a fund of practical cost information of a type which does not as a rule find its way into print. The Atlantic City Convention was probably the most important gathering of cost men which has been held in this country and the opinions of the men who took part in this conference are worthy of some study.

The Year Book is distributed to all members of the Association. We are informed by the Secretary that there are a few copies available for general distribution to men interested in cost questions. The offices of the Association are in Rooms 2546-2548 Woolworth Building, 233 Broadway, New York City.

LUMBER

ANNOUNCEMENT

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LUMBER COMPANY, LIMITED
Successors to our
HARDWOOD DEPARTMENT
For whom we bespeak the continued patronage of our many friends

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Everything in Machine Shop Equipment

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Your Problems!
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Our engineering staff take a minute interest in the requirements of every customer and at all times are ready to give advice in the selection of proper equipment and the solving of all machinery problems that frequently come up in the machine and woodworking shops.

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General Woodworking Trade Mart

Quick Action Section

Equipment Materials Employment

Veneer Lathe Wanted

Good second-hand veneer machine.

Write J. Stanley Wedlock, Charlottetown, P. E. Island. 1-3

FOR SALE

Berlin Triple Drum Sander, 48".
Fay & Egan Drum Sander, 48".
Berlin Triple Drum Sander, 43".
McDonough 54" Band Resaw, Vertical
Diamond Horizontal Band Resaw.
American Timber Sizer.
70" Sheldon Fan.
400 H. P. Cross Compound Corliss.

Write Box 82, Canadian Woodworker, Toronto. t.f.

I Offer the following

Used Machines

For Immediate Shipment

Subject to prior sale

Moulder, Hermance 10" 4 Side.
Moulder, Greenlee Bros. 6" 4 Side.
Moulder, American 10" 4 Side.
Moulde, H. B. Smith 4" 4 Side.
Sander, Berlin 36" 2 Drum.
Sander, 60" Columbia 3 Drum.
Sander, Yates 43" Endless Bed.
Sander, 48" H. B. Smith 3 Drum Endless Bed.
Belt Sander, Curtis No. 20.
Edge Sander, Duplex Double Belt.
Belt Sander, Moore 6" Double Belt.
Scraper, Baxter D. Whitney 42".
Rubbing Machine, Moore Machine Co.
Matcher, No. 229 American Hardwood.
Matcher, American No. 22 24" 4 Side.
Matcher, Woods 24" x 6".
Band Resaw, Mershon 44".
Band Resaw, Connell & Dengler 60".
Band Rip Saw, American No. 1 Roll Feed.
Band Rip Saw, Fay & Egan No. 202 Chain Feed.
Band saw, 36" Tilting Table.
Circular Resaw 44".
Jointer, Falls Machine Co. 24" Power Feed Undercut.
Buzz Planer, 24" Buss Machine Works.
Planer, Buss Machine Works 30" Cabinet.
Planer, 24" Whitney Cabinet.
Planer, 24" E. B. Holmes Single.
Boring & Mortising, Bentel Margent 4 Spindle.
McKnight, No. 26-F Double Sawing and Boring Machine for chair work.
Shaper, 2 Spindle.
Dowell Rod Machine, E. B. Hayes.
Dowell Gluer and Driver, E. B. Hayes.
Power Door Clamp, E. B. Hayes.
Carving Machine, Moore 4 Spindle.
Morgan Lock Corner Machine.

C. J. ANDERSEN,
15 W. Swan St.,
Buffalo, N. Y.
t.f.

Machinery Wanted

Veneer Jointer, 8 ft. preferred, also Veneer Taping Machine, 3 ft. Must be in first class condition and a bargain for cash. Box No. 33, Toronto Post Office. 3

For Sale

Box-Board Printer, 18 x 44", F. X. Hooper, two-color, Knocker feed, $975.-00. All kinds Woodworking Machinery for sale.

Chas. N. Braun Machinery Co., Fort Wayne, Ind., U. S. A. 3-4

For Sale

Sash, door and planing mill machinery, boilers, engines, motors, pulleys, gears, machine shop and moulding machinery. 8 ft. Linderman glue jointer. Full printed list on request. Cargill Limited, Cargill, Ont. 3-6

FOR SALE

Planing mill on the Canadian National Railways, between Levis and Mont Joli, doing a Milling in Transit business, with work ahead guaranteed for several months at profitable prices. Fully equipped with Planer, Sticker, Resaw and Ripper, handli · several cars daily, with siding capac / of nine cars, right in the heart of lumber section of this Province, where more than ten times mill's capacity has been refused during the past year. Mill built of Cement with Cement Floor, Asbestos Roof, with additional buildings for Sash and Door factory or box factory, and sheds for piling dressed lumber, also with piling ground for about half a million feet of lumber. Price $30,000.00 on terms that will be satisfactory. A live man or group of men can easily clean up $2,000.00 per month net profit, and mill can be extended for increased business very easily. Principals only. If interested write to Box 106, Canadian Woodworker, Toronto, Ont. 1-3

Charring Posts of No Value

Service tests made by the U.S. Forest Products Laboratory on fences whose posts were charred at the lower end to prevent decay, in comparison with fences having untreated posts, showed that the charred posts were if anything less durable than the uncharred posts. It is concluded by the laboratory that charring is of little value in protecting the butts of fence posts and telephone poles from decay. One reason for the conclusion, apart from the test results, is that charring is unlikely to reach to the bottom of season checks and similar depressions in the surface of the wood.

Bargains in Used Machinery

Subject to prior sale.

YATES No. 341 Band Resaw with bevel gear drive, loose pulley and complete filing tools.

WOODS 15 x 6" Planer and Matcher.

WOODS 24 x 6" Planer and Matcher.

YATES 30 x 6" No. 160 Double Surfacer, rebuilt and warranted as good as new.

MACGREGOR Double Surfacer 28 x 6 with extra set of knives.

YATES No. 87 Hardwood Planer and Matcher.

MISCELLANEOUS

MacGregor Mortiser
C.M.C. Buzz Planer
C.M.C. 6" Sash Moulder
Crescent 18" Surface Planer
MacGregor Tenoner
C.M.C. 12" Moulder
MacGregor Dowel Machine
C.M.C. Blind Mortiser
Rogers Saw Sharpener (New)
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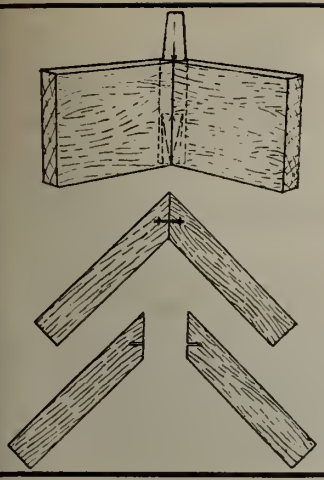

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METHOD IS THE BEST

for making mitered, butt or any other joint.

SAVES—Time, Labor and Money

PRODUCES—Economy and Durability

Used by all leading Furniture, Cabinet and Casket Manufacturers, for sale by dealers in Cabinet Hardware, or direct if you so prefer.

Clamp Nail Company 4532 PALMER ST., CHICAGO

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DO YOU KNOW

THE SIGNODE WAY

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THE SENSIBLE WAY

THE SUCCESSFUL WAY

THE SATISFACTORY WAY

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STRAPPING YOUR SHOOKS, VENEERS, MOULDINGS, AND BUNDLES OF LUMBER FOR SHIPMENT

LET US SEND YOU FULL DETAILS

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SAN FRANCISCO

STRAPPED SHOOKS READY FOR SHIPMENT

THE CHICAGO MIRROR AND ART GLASS COMPANY

Manufacturers of

RELIABLE MIRRORS

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PLATE GLASS TOPS

Send your specifications to us at

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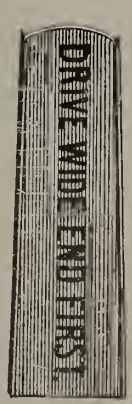

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The best labor saving device made, for making mitered joints for Furniture, Cabinet, Table, Phonograph and Casket Manufacturers.

Write for samples and prices.

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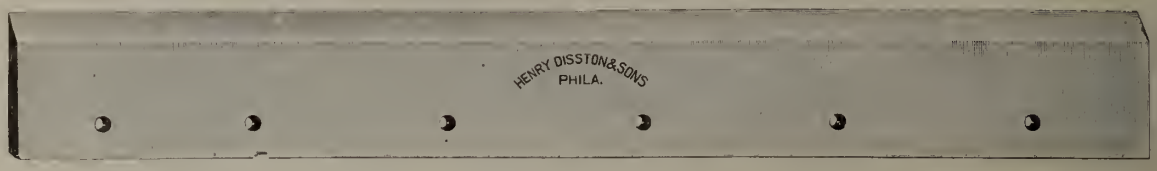
ALL STYLES OF KNIVES FOR WOODWORKERS



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Disston knives cut fast and clean ,and hold their cutting edge.

Write for the Disston booklet on Machine Knives.

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TORONTO CANADA
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Maple Leaf Saws

Are Made by an ALL Canadian Firm and ALL Canadian Workmen

We make
Compass
Back
Mitre Box
and every
Kind of Saw
used in
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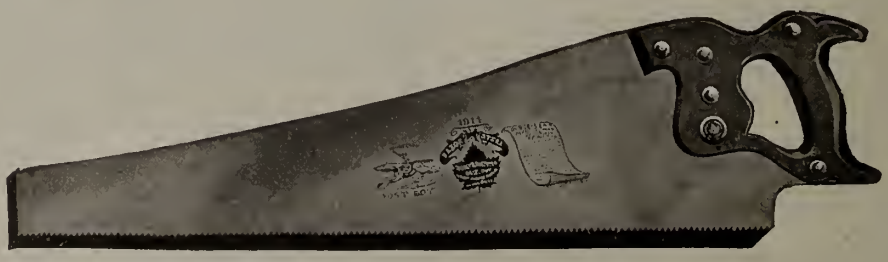

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Our No. 1914 Hand Saw

Something New in Handsaws

Notice the design of the handle. Observe how it is attached to the blade. The handle is slit at top and bottom. The blade is so designed that it extends through slit the entire length of handle, and projects beyond the point of the horns.

ADVANTAGES GAINED:—Unbreakable handle, perfect balance, the "right hang," comfortable grip.

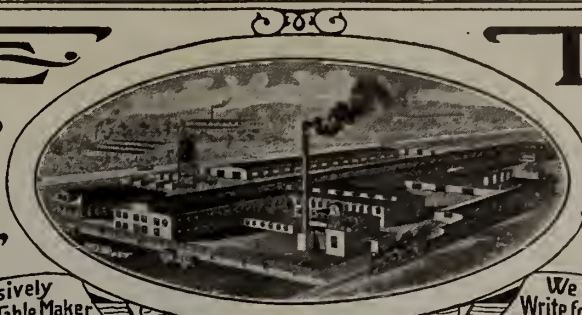
THE BLADE:—Made of Jessop's highest grade steel; taper ground; secret tempered; highly polished.

THE HANDLE:—Mahogany finish.

Shurly-Dietrich Co., Limited

Vancouver, B. C. GALT, ONTARIO Ottawa, Ont.

TABLE SLIDES, RIMS, SOLID TOPS, FILLERS



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The Largest Plant in America Devoted Exclusively to the Manufacture of Special Table Parts for the Table Maker

We Ship COMBINATION CARS Write for Lists, Cuts and Prices on Our Different Articles

THE JEFFERSON WOOD WORKING CO.
INCORPORATED
LOUISVILLE, KY.

THE SLIDE IS THE HEART OF YOUR EXTENSION TABLE

If the Slide Does Not Work Properly Your Whole Table is Condemned

Wabash Slides insure **Satisfied Customers**

SLIDE MAKING is a SPECIALTY BUSINESS

We can Furnish Better Slides for Less Cost

Eliminate Slide Troubles by using WABASH SLIDES

MADE BY

B. Walter & Company

Edsall St., Wabash, Ind.

Do You Know Me?

The Productimeter

I am the little machine that is always at the head of my class in accuracy, reliability, promptness, and deportment.

You attach me or one of my brothers to your moulders, matchers, stickers, self feed rip saw, or any other machine and I count or measure all the lumber going through. Then I tell you the exact amount so you can stop guessing at your production. I'll say I'm some boy.

Write my factory what machine you want me to check up on, and they'll send me to you on 30 days' trial. I have to make good or you can send me back.

Catalog No. 17 tells all about me.

The Durant Manufacturing Co.

615 Buffum St. MILWAUKEE, WIS.

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The following books are offered at special prices subject to previous sale:

"Woodwork Joints," by Evans Bros., London England; 214 pages, with 430 illustrations and a complete index of eleven hundred references. Price $1.50.

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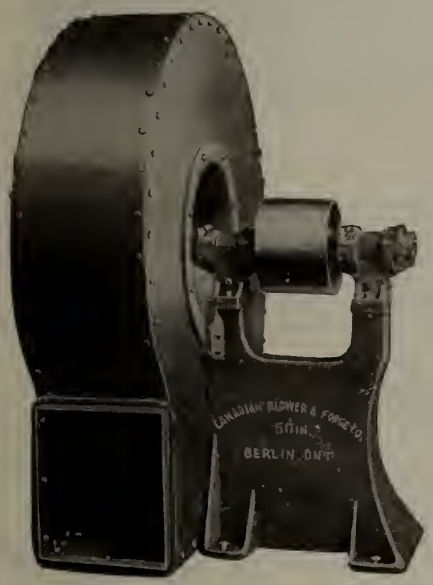

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A clean shop with machines free from shavings, chips or sawdust makes for greater efficiency.

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The Hand-Hole Machine will cut hand holes in crate and box ends. It is worked by a carriage and levers, and will cut any size or length hole with either round or bevel edge in any kind of wood.

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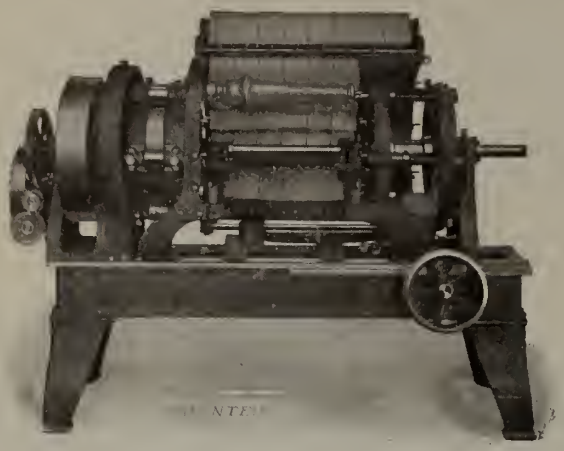

that will help you to reduce costs and eventually prices.

The Nash No. 10 Sander for furniture turnings can do the work of from 5 to 15 men and do it better.

Just ask me to prove this.

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for Store Fixtures and Commercial Furniture

Cast Brass Leg Sockets

Style 808

Style 814

No.	Opening at Top inches	Height inches
A808	1	1
B808	1¼	1¼
C808	1½	1¼
D808	1¾	1½
E808	2	2
F808	2¼	2¼

No.	Opening at Top inches	Height inches
A814	1	⅞
B814	1¼	1
C814	1½	1⅛
D814	1¾	1⅜
E814	2	1½
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Also in wrought brass, either straight or tapered

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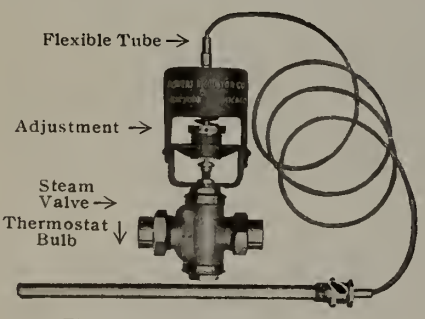

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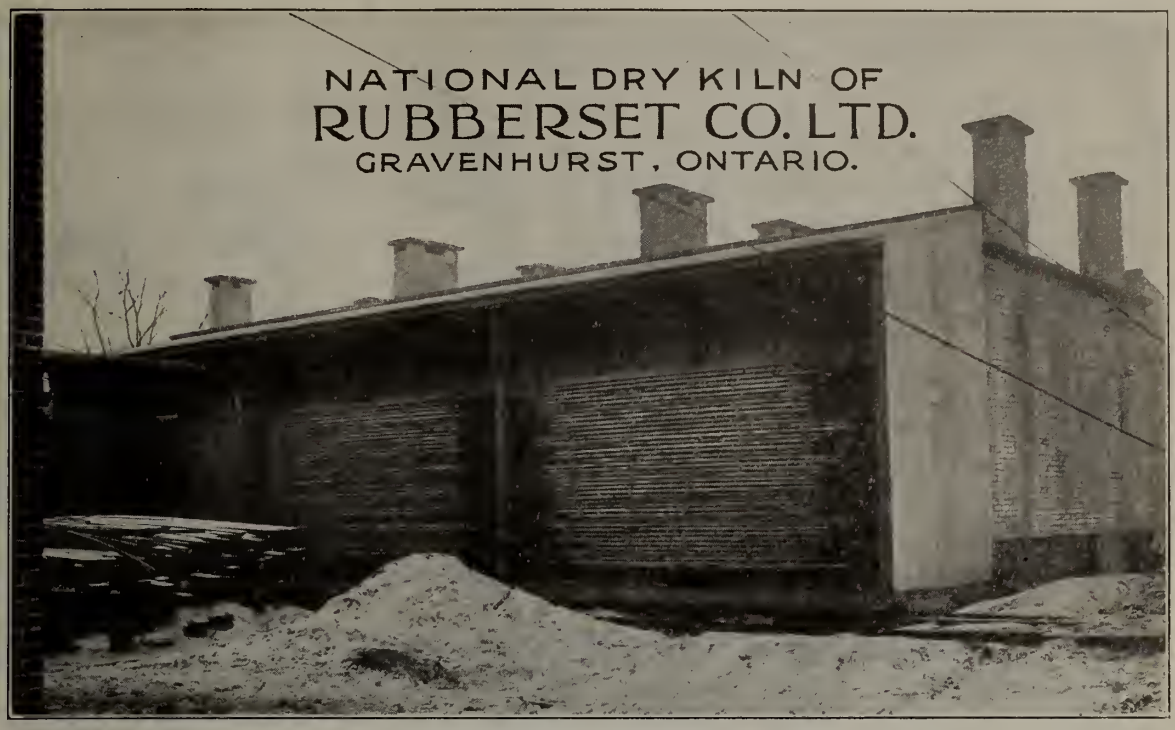

Mr. McIntosh believed, during this kiln installation, that he did not need all that was being put on.

Mr. McIntosh's kiln is like an automobile with a self-starter and electric lights, as compared with one without.

THE ACTUAL USE OF AN ARTICLE IS THE PROOF.

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Indianapolis, Indiana.

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As you know, our kilns are equipped with all your automatic control devices, such as the automatic water supply tanks, dry bulb thermostat, wet bulb thermostat, scalo meters, recording thermometers, door carriers, etc.

I thought, when installing the kiln, that some of the above were superfluous, but I can assure you that I would not think of doing without any one of them now. We have been operating our kilns for about two months, and find them to work better every day.

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We have just had all the pipes leading to the kiln covered with Johns-Manville insulating preparation, which we find is a great saving in heat.

I shall be pleased at any time to give you any information you may desire about our kilns.

Very truly yours,
Rubberset Company, Ltd.,
Gravenhurst, Ontario.
Per J. J. McIntosh,
Superintendent.

December 21, 1920.

The National Dry Kiln Co., 1117 East Maryland Street, Indianapolis, Indiana

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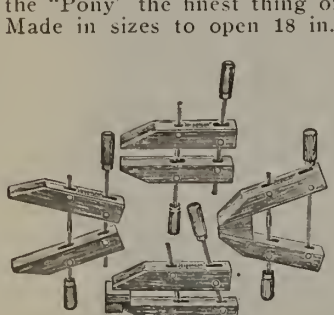
NATIONAL DRY KILNS

"Pony" Cabinet Clamp

For lightness combined with strength this clamp has no equal. All parts are selected from the best materials obtainable and we have spared no effort to make the "Pony" the finest thing of its kind on the market. Made in sizes to open 18 in. to 72 in.



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Peerless Adjustable Hand Clamp

Fits every grip without a slip and takes a tighter hold with less effort. It is a tool of real economy and a clamp that insures efficiency.

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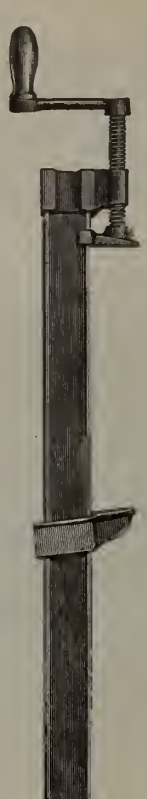
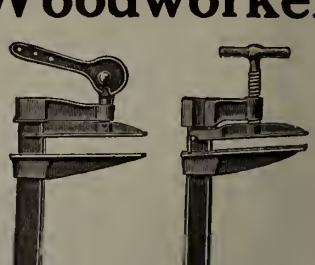


Colt's Clamps

for the

Woodworker



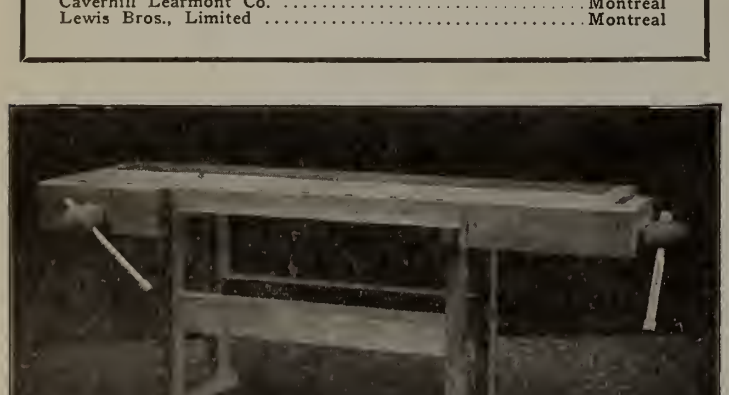
Colt's Universal and Vise Clamps are unsurpassed for the Furniture Manufacturer and General Woodworker. They are made right, both in design and quality of materials and workmanship.

Colt's Clamps are quick-acting and have broad jaw clamping surface.

For further information write for Catalogue No. 294.

Batavia Clamp Co.

235 Centre St. **BATAVIA, N. Y.**



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Manufactured by

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Try Empire and you will use no other.

We specialize in all types of woodworking tools.

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TORONTO

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Alphabetical Index to Advertisers, Page 12

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All thicknesses and grades in
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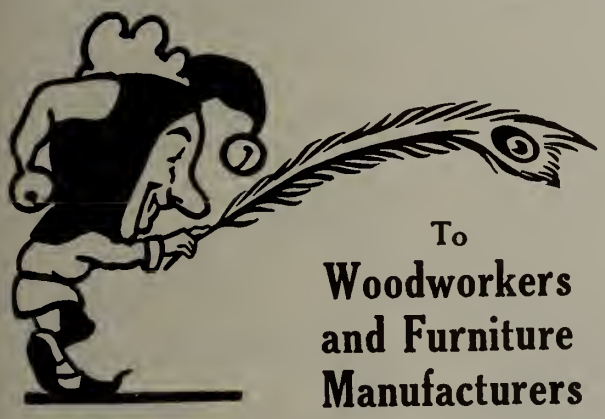
TORONTO CANADA



To Woodworkers and Furniture Manufacturers

Your requirements in Reed Forms for Wicker Work Furniture, Mechanic's Tool Cases, Dowels, Novelties, Cedar Chests, Piano Lamps, Table Lamps, etc., can be promptly supplied by us.

We are always pleased to quote prices and give any information you may desire. Try us on your next order.

THE

Brantford Pattern Works

BRANTFORD

Sale of Machinery

All Guaranteed in First Class Running Condition

Dowling Machine, M-31, Cowan No. 2 capacity 1" to 2½" 7 Heads	$ 400.00
Tenon Machine (Clark-Demill), latest type Roller carriage, both heads can be adjusted in one operation	350.00
Waymoth Lathe for Chisel and Pail Handles, etc	250.00
Moulder, Cowan—12"—4 sided	750.00
Moulder, Clark-Demill, 12"—4 sided	750.00
Moulder, Goldie-McCullough—8"—4 sided	300.00
Barrel Head Machines—Rochester—a quantity of Saws	525.00
Single Surfacer, McGregor-Gourlay, 24" x 7	200.00
Single Surfacer, 30" x 10	300.00
Double Surfacer, C.M.C. 30" x 12	1250.00
Endless Bed Planer, Cowan 26" x 10	575.00
Buzz Planer, Clark-Demill—16"	200.00
Elliot Woodworker No. 5, with jointer attachment	275.00
Scroll Saw, C.M.C. or Goldie-McCullough	100.00
Band Saw, McGregor-Gourlay—34"	200.00
Sander—American, Double Disc, 36", adjustable table, for sanding bevels	350.00
Sander—American, 3 drum, 37"	750.00
Drill Press, Perfect, 14"	75.00
Gravity Swing Cut Off Saw, McGregor-Gourlay	90.00
Swing Saw, Goldie-McCullough, 8 ft.	90.00

All Machines in Stock. Can be inspected at our Warehouse. Prices f.o.b. Toronto

General Machinery Company

67-69 Frederick St., Toronto

TELEPHONE MAIN 2200

"Canadian Woodworker" Buyers' Directory—Continued

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GLUE
Casein Mfg. Company, New York, N.Y.
Casein Glue Mfg. Co., Chicago, Ill.
Perkins Glue Company, South Bend, Ind.
Sampson & White, London, England.

GLUE CLAMPS
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane, & Company, Kitchener.

GLUE HEATERS
Fay & Egan Co., J. A., Cincinnati, Ohio.
International Electric Co., Indianapolis, Ind.
Jackson, Cochrane, & Company, Kitchener.
Pringle, R. E. T., Toronto, Ont.

GLUE JOINTERS
Casey Co., M. E., Montreal, Que.
Jackson, Cochrane & Company, Kitchener, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GLUE SPREADERS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener.

GLUE ROOM EQUIPMENT
Perrin & Company, W. R., Toronto, Ont.

GRINDERS (Cutter)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

GRINDERS (Knife)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDERS (Tool)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GROOVING HEADS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Mattison Machine Works, Rockford, Ill.

GUM LUMBER
Aberdeen Lumber Co., Pittsburg, Pa.
American Hardwood Lumber Co., St. Louis, Mo.
Anderson-Tully Co., Memphis, Tenn.
Barr-Holaday Lumber Co., Greenfield, Ohio.
Brown & Co., George C., Memphis, Tenn.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Darnell-Love Lumber Co., Leland, Miss.
Gum Lumber Association, Memphis, Tenn.
Hyde Lumber Company, South Bend, Ind.
Merceau-Hawkins Tie Co., Huntington, W.Va.
Paepcke-Leicht Lumber Co., Chicago, Ill.
Sondheimer Co., E., Memphis, Tenn.
Steele & Hibbard Lumber Co., St. Louis, Mo.
Thomas & Proetz Lumber Co., St. Louis, Mo.

HAND SCREWS
Fay & Egan Co., J. A., Cincinnati, Ohio.

HANDLE & SPOKE MACHINERY
Fay & Egan Co., J. A., Cincinnati, Ohio.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Whitney & Son, Baxter D., Winchendon, Mass

HARDWARE
Garden City Plating & Mfg. Co., Chicago.
Laidlaw Bale-Tie Co., Hamilton, Ont.
Weber-Knapp Co., Jamestown, N.Y.

HARDWOOD DIMENSION STOCKS
Brown Bros. & Co., New York.

HARDWOOD LUMBER
American Column & Lumber Co., Columbus, Ohio.
American Hardwood Lumber Co., St. Louis, Mo.
American Oak Mfrs.' Assn., Memphis, Tenn.
American Walnut Association, Washington, D.C.
Anderson Lumber Co., C. G., Toronto, Ont.
Anderson, Shreiner & Mawson, Toronto, Ont.
Anderson-Tully Co., Memphis, Tenn.
Arkla Lumber & Mfg. Co., St. Thomas.
Arrow Lumber Co., Parkersburg, W. Virginia
Atlantic Lumber Company, Toronto, Ont.
Bacon Lumber Co., Cleveland, Ohio.
Banning, Leland G., Cincinnati, Ohio.
Barr- Holaday Lumber Co., Greenfield, Ohio.
Barlett Lumber Co., W. C., Charleston, Va.
Bedna Young Lumber Co., Jackson, Tenn.
Biglow-Cooper Co., Bay City, Mich.
Boland Lumber Co., Grand Rapids, Mich.
Bonner & Sons, J. H., Memphis, Tenn.
Brown Bros. Co., New York.
Brown & Company, Geo. C.
Brown & Hackney, Inc., Memphis, Tenn.
Bruce Co., E. L., Little Rock, Ark.
Burns & Knapp Lbr. Co., Conneautville, Ohio.
Bury & Company, Robert, Toronto, Ont.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Conkling Lumber Co., Frank A., Memphis, Tenn.
Canadian General Lumber Co., Toronto, Ont.
Chicago Mill and Lumber Co., Chicago, Ill.
Clark & Sons, Edward, Toronto.
Dacus-Richards Hardwood Co., Memphis, Tenn.
Darnell-Love Lumber Co., Leland, Miss.
DeHewit Lumber Co., Huntington, Va.
Dooley Lumber Co., F. T., Memphis, Tenn.
Evansville Band Mill Co., Evansville, Ind.
Gayoso Lumber Co., Memphis, Tenn.
Gill Lumber Co., Chas., Wausau, Wis.
Hall Lumber Co., Thos., Charleston, W.Va.
Hart & McDonagh, Toronto. Ont.
Heeney, Percy E., Kitchener, Ont.
Hunt, Wellington & Smith, Nashville, Tenn.
Hyde Lumber Co., South Bend, Ind.
Johnson Bros., Memphis, Tenn.
Korn-Conkling Co., Cincinnati, Ohio.
Kosse, Shoe & Schleyer Co., Cincinnati, O.
Kraetzer-Cured Lumber Co., Greenwood, Miss.
Lawrence & Co., P. J., St. Louis, Mo.
Leach & Co., J. D., Chicago, Ill.
Long-Knight Mfg. Co., Indianapolis, Ind.
Luchrman Hardwood Lbr. Co., St. Louis, Mo.
May Bros., Memphis, Tenn.
McLean Mahogany & Cedar Co., Buffalo, N.Y.
McLennan Lumber Co., Montreal, Que.
Memphis Band Mill Co., Memphis, Tenn.
Merceau-Hawkins Tie Co., Huntington, W.Va.
Mowbray & Robinson, Cincinnati, Ohio.
Murrelle Lumber Company, Memphis, Tenn.
Nicholson & Co., E. M., Montreal, Que.
Otis Mfg. Co., New Orleans, La.
Paepcke Leicht Lumber Co., Chicago, Ill.
Pedwell Hardwood Lumber Co., Toronto, Ont.
Perkins Bros., Kelso, Ark.
Peytona Lumber Co., Huntington, W. Va.
Pickrel Walnut Co., St. Louis, Mo.
Powe Lumber Co., Thos. E., St. Louis, Mo
Ritter Lumber Co., W. M., Columbus, Ohio
Rush Lumber Co., Memphis, Tenn.
Sawyer Goodman Co., Marinette, Wis.
Sondheimer Co., E., Memphis, Tenn.
Spencer, C. A., Montreal, Que.
Spotswood & Son, E. R., Lexington, Ky.
Stark & Co., Jas. E., Memphis. Tenn.
Steele & Hibbard Lumber Co., St. Louis, Mo.
Sterrett, Will S., Cincinnati
Stimson Hardwood Co., J. V., Memphis, Tenn.
Tallahatchie Lumber Co., Memphis, Tenn.
Thompson, Katz Lumber Co., Memphis, Tenn.
Thompson & Co., Lewis, Philadelphia, Pa.
Tustin Hardwood Lumber Co., Memphis, Tenn.
Upham & Walsh, Chicago, Ill.
Utley-Holloway Co., Chicago, Ill.
Warren-Ross Lumber Co., Jamestown, N.Y.
Wheeler-Timlin Lumber Co., Wausau, Wis.
Whiting Co., Wm. S., Johnson City, Tenn.
Woodruff Powell Lumber Co., South Bend, Ind.
Wayne Lumber Co., New York
Wood Mosaic Co., Louisville, Ky.
Yellow Poplar Lumber Co., Coal Grove, Ohio.

HYDRAULIC VENEER PRESSES
Perrin & Company, Wm. R., Toronto, Ont.

INSURANCE
Lee Blakemore, Inc., Toronto, Ont.

KNOBS
Waddell Mfg. Co., Grand Rapids, Mich.

JOINTERS
Canada Machinery Corporation, Galt, Ont.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

KNIVES (Planer and others)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

LATHES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Defiance Machine Works, Defiance, Onio.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochane & Company. Kitchener. Ont.
Mattison Machine Works, Rockford. Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie. H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

LEATHER (Artificial)
Fibro Mfg. Company, Beverly, N. J.

LEATHER CLOTH
Zapon Leather Cloth Co., New York.

LUMBER MEASURER
Durant Mfg. Co. Milwaukee, Wis.

MACHINE KNIVES
Canada Machinery Corporation. Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Peter Hay Knife Company, Galt, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont

MIRRORS
Chicago Mirror & Art Glass Co., Chicago, Ill.
Hart Mirror Plate Co., Grand Rapids, Mich.

MITRE SAWS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto. Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.

MOTOR TRUCK EXTENSIONS
Swedish Crucible Steel Co., Windsor, Ont.

MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A. Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

NAILS
Laidlaw Bale-Tie Co., Hamilton, Ont.

NAILING MACHINES
Morgan Machine Co., Rochester, N.Y.

OIL
Zero Oil Co., Parkersburg, Pa.

OIL STONE GRINDERS
Mummert-Dixon Co., Hanover, Pa.

PANELS
Algoma Panel Co., Algoma, Wis.
Gorham Bros., Mount Pleasant, Mich.
Hardwood Products Co., Nennah, Wis.
Hay & Co., Woodstock, Ont.
Holden Company, Henry S., Chicago, Ill.
Roberts, Geo. G., Chicago, Ill.
Waetjin & Co., L., Milwaukee, Wis.

PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Wallace & Co., J. D., Chicago. Ill.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PERIOD MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich.

PERIOD TURNINGS
Decorators Supply Co., Chicago, Ill.
Walter & Sons, J., Kitchener, Ont.

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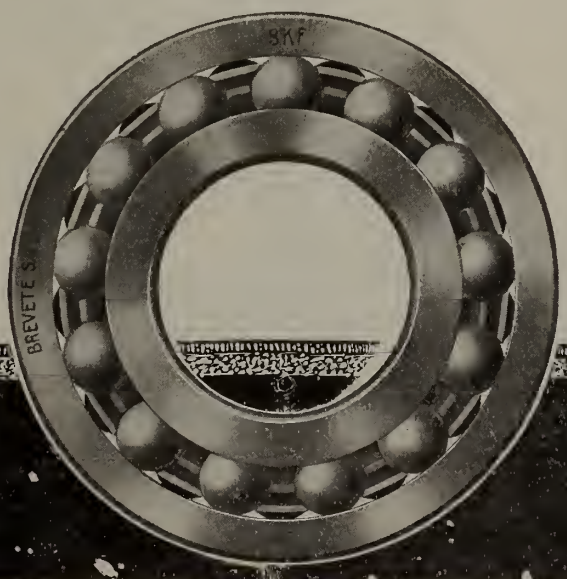
Toronto and Montreal



"Canadian Woodworker" Buyers' Directory—Continued

PLANERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLANING MILL MACHINERY
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PORTABLE DRILLS
Wisconsin Electric Co., Wisconsin, U.S.A.

PRESSES (Veneer)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Jackson, Cochrane & Company, Kitchener, Ont.
Perrin & Co., Wm. R., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

REED
Carter & Co., E. T., Toronto, Ont.
Overseas Reed and Cane Co., Ionia, Mich.

REED MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

RESAWS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

RIM AND FELLOE MACHINERY
Defiance Machine Works, Defiance, Ohio.
Fay & Egan Co., J. A. Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford. Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

ROSETTES
Waddell Mfg. Co., Grand Rapids, Mich.

RUBBING MACHINES
DeVilbiss Mfg. Co., Toledo, Ohio.
Mattison Machine Works, Rockford, Ill.

SAFETY DEVICES
Cowan & Company, Galt, Ont.

SANDERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SAND PAPER
Manning Abrasive Company

SASH, DOOR & BLIND MACHINERY
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Elliot Machinery Co., Belleville, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SAWS
Atkins & Co., E. C., Indianapolis, Ind.
Disston & Sons, Henry, Toronto, Ont.
Elliot Machinery Co., Belleville, Ont.
Radcliff Saw Mfg. Company, Toronto, Ont.
Shurly-Dietrich, Ltd., Galt, Ont.
Simonds Canada Saw Co., Montreal, Que.
Wallace & Co., J. D., Chicago, Ill.

SAW BENCH
Wallace & Co., J. D., Chicago, Ill.

SAW SWAGES
Cowan & Company, Galt, Ont.
Crowel, D. J., Buffalo, N. Y.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Radcliff Saw Mfg. Co., Toronto, Ont.

SAW TABLES
Canada Machinery Corporation, Galt, Ont. ...
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Yates Machine Co., P. B., Hamilton, Ont.

SCRAPING MACHINES
Canada Machinery Corporation, Galt, Ont. ..
Garlock-Walker Machinery Co., Toronto, Ont.
Whitney & Sons, Baxter D., Winchendon, Mass.

SCREW DRIVING MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.
Reynolds Machine Co., Massillon Ohio.

SCROLL SAWS
Canada Machinery Corporation, Galt, Ont. ..
Casey Co., M. E., Montreal, Que.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Jackson, Cochrane, & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamiltonfi Ont.

SECOND-HAND MACHINERY
Casey, M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Osborne Sexton Machinery Co., Columbus, O.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

SHAPERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Sons, Baxter D., Winchendon, Mass
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SHAPER COLLARS
Woodworkers Tool Works Chicago, Ill.

SHAVING COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

STAINS
Ault & Wiborg, Toronto, Ont.
Marietta Pairt & Color Co., Marietta, Ohio.
Shannon Co., Ed. J., Cincinnati, Ohio.
Williams Bros. & Co., Hounslow, Eng.

SINGLE SPINDLE BOXING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

STAVE SAWING MACHINE
Whitney & Son, Baxter D., Winchendon, Mass

STEEL DOOR MATS
Cary Mfg. Company, Brooklyn, N.Y.

SURFACERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto. Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Yates Machine Co., P. B., Hamilton, Ont.

SWING SAWS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Eaglesfield, R. D., Indianapolis, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE LEG LATHES
Fay & Egan Co., J. A., Cincinnati, Ohoa.
Mattison Machine Works, Rockford, Ill.
Whitney & Son, Baxter D., Winchendon, Mass.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE SLIDES
Jefferson Woodworking Co., Louisville, Ky.
Walter & Company, B., Wabash, Ind.

TEMPERATURE REGULATORS
Canadian Powers Regulator Co., Toronto, Ont.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Compan, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TIME CLOCKS
International Business Machines Co., Toronto, Ont.

TOPS
Gorham Bros., Mount Pleasant, Mich.

TRIMMERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Preston Woodworking Machinery Company, Pretson, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TRUCKS
Chapman Ball Bearing Co., Toronto, Ont.
Cowan Truck Company, Toronto, Ont.
National Dry Kiln Co., Indianapolis, Ind.

TURNED WOOD GOODS
Algoma Wood Products Co., Algoma, Wis.
Canada Wood Specialty Co., Orillia, Ont.
Esthes & Sons, E. B., New York.

TWINES & WEBBING
Doon Twines, Ltd., Kitchener, Ont.

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Are built strongly for heavy continuous service. Machines adapted to all kinds of special nailing.

Regular machines for all sizes of boxes and crates.

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Machines that save money

Morgan Machine Co.

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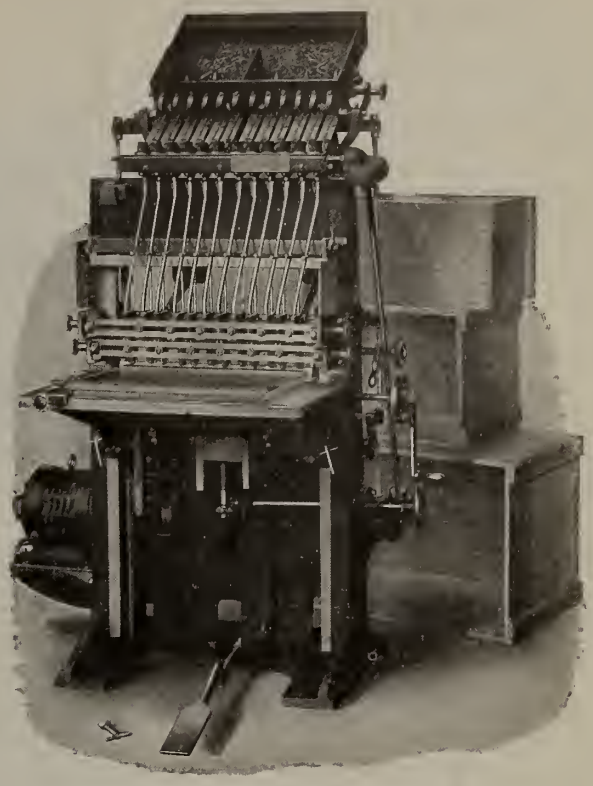

Morgan No. 12-30 Open Back Nailing Machine, Fitted with motor.

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The Olson Frame Extension

Increase the carrying capacity and therefore the usefullness of your Ford Truck by the addition of the Olson Frame Extension.

Particularly adaptable for the transportation of lumber and furniture for either short or long distances.

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Our nearest branch will be pleased to send you fullest information.

Just a Few Users —

Robert Bury Co. Canada, Limited, Toronto, Ontario.

Langmuir Manufacturing Company, Toronto, Ontario.

Gardiner Lumber Company, Galt, Ontario.

Batts, Limited, Toronto, Ontario.

Swedish Crucible Steel Co. of Canada, Limited, Windsor, Ont.

Branches: 901 Royal Bank Bldg., TORONTO 285 Beaver Hall Hill, MONTREAL.

"Canadian Woodworker" Buyers' Directory—Continued

VARNISHES
Adams & Elting Co., Chicago and Toronto.
Ault & Wiborg Company, Toronto. Ont.
Penfound Varnish Co., Toronto, Ont.

VARNISH DRYERS
Nicholls Co.. A. S., New York, N.Y.

VARNISH SPRAYERS
DeVilbiss Mfg. Co., Toledo, Ohio.
Paasche Air Brush Company, Chicago, Ill.

VENEERS
Batesville Lumber & Veneer Co., Lawrenceburg, Ind.
Birds Eye Veneer Co., Escanaba, Mich.
Bury & Compny, Robert, Toronto, Ont.
Central Lumber Co., Indianapolis, Ind.
Christmann Veneer & Lumber Co., St. Louis, Mo.
Curtis Co., C. E., Chicago
Dean Spicker Company, Chicago, Ill.
Empire Veneer Company, Chicago, Ill.
Evansville Veneer Co., Evansville, Ind.
Freiberg Lumber Co., Cincinnati, Ohio
Hartzell, Geo. W., Piqua, Ohio.
Hoffman Bros. Company, Fort Wayne, Ind.
Holden, Henry S., Chicago, Ill.
Hardwood Prudocts Co., Neenah, Wis.
Korn-Conkling Co., Memphis, Tenn.
Long-Knight Lumber Co., Indianapolis, Ind.
Litton Veneer Co., Rockford, Ill.
Memphis Veneer & Lumber Co., Memphis, Tenn.
Mowhawk Veneer Co., Warren, Pa.
Munising Woodenware Co., Munising, Mich.
Nartzik, J. J., Chicago, Ill.
National Veneer & Lumber Co., Indianapolis, Ind.
North Vernon Lumber Co., North Vernon, Ind.
Northwestern Cooperage & Lumber Co., Gladstone, Mich.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod-Jurden Co., Memphis, Tenn.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Veneer Co., New Albany, Ind.
Roberts, Geo. G., Chicago, Ill.
Southern Veneer Mfg. Co., Louisville, Ky.
Stimson Veneer & Lumber Co., Memphis, Tenn.
Sturm Co., Adolph, Chicago, Ill.
Talge Mahogany Co., Indianapolis, Ind.
Thompson & Co., Lewis, Philadelphia, Pa.
Toronto Veneer Company, Toronto, Ont.
Veneer Manufacturers Co., Chicago, Ill.
Waetjen & Co., George L., Milwaukee, Wis.
The Williamson Veneer Company, Mills—Baltimore, Md. Sales Branches, New York, N. Y., Chicago, Ill., Jamestown, N.Y., High Point, N.C.
Warren Ross Lumber Co., Jamestown, N. Y.
Wood Mosaic Co., Louisville, Ky.

VENEER TAPE
Canadian Nashua Paper Co., Peterboro, Ont.
Gummed Products Co., Troy, Ohio.
Ideal Coated Paper Co., Brookfield, Mass.

VENTILATING APPARATUS
Canadian Blower & Forge Co., Kitchener, Ont.
Neville-Cooper Co., Toronto.

VENEER JOINTERS
Garlock-Walker Machinery Co., Toronto, Ont.

VENEER MACHINERY
Garlock-Walker Machinery Co., Toronto, Ont.
St. Joseph Iron Works, St. Joseph, Mich.

VENEER PRESSES (Hand and Power)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Perrin & Company, Wm. R., Toronto, Ont.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.

WALNUT LUMBER
American Walnut Mfrs. Assn., Chicago.
Pickrel Walnut Company, St. Louis.
Purcell Walnut Lumber Co., Frank, Kansas City.

WIRE
Laidlaw Bale-Tie Co.. Hamilton, Ont.

WIRE BOX STRAPPING
Cary Mfg. Company, Brooklyn, N.Y.

WOOD FINISHES
Adams & Elting Co., Chicago and Toronto.
Ault & Wiborg, Toronto, Ont.
Penfound Varnish Co., Toronto, Ont.

WOODWORKING MACHINERY
General Machinery Co., Toronto, Ont.

WOOD STAINS
Williams Brothers & Co

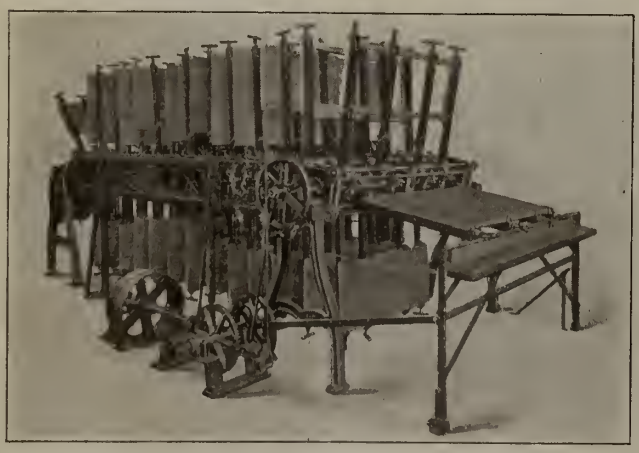
WOOD TURNING MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Yates Machine Co., P. B., Hamilton, Ont.

WORK BENCHES
Fay & Egan Co., J. A., Cincinnati, Ohio.

WOOD LATHES
Oliver Machinery Co., Grand Rapids, Mich.

WOODWORKING SPECIALTIES
Brantford Pattern Works, Brantford, Ont.

One Man Does the Work of Two
with a Billstrom Glue Clamp Carrier



For every plant where much edge-gluing is done there is a real need for a Billstrom.
Here's why:—

The empty clamp is held at just the right height for the greatest convenience of the workman.
When the clamp is filled he pulls a cord, which carries the filled clamp away and deposits an empty one in its place.
One man can accomplish as much by using it as two men can do employing the old methods.
It holds the work off the floor until the glue has set, when the glued stock can be quickly removed and piled flat, thus greatly conserving space.
It reduces the labor and cost of edge gluing to the minimum.
There is a sizs to suit your particular requirements.

N. J. BILLSTROM
2002 NINTH ST. ROCKFORD, ILL.

44 Yates No. 275
36 and 66-in. Automatic
Knife Grinders,
Brand New, at
One-half Price

Machines arranged for Motor Application as per cut, or regular belt drive, if wanted.

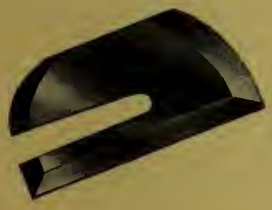
We have in Cincinnati, available at once, three Whitney 30-in. single surfacers and two Whitney 30-in. double surfacers, all with sectional rolls; three double arbor revolving saw tables; three single arbor tilting table saw benches; F.&E. single-end tenoner with roller table, and a few other choice machines. All are in exceptionally fine condition—are doing precision work at the present time.

7 New Hermance Molders, 8, 10 and 12-in., Stationary and slip-on heads.
8 New Andrew Multiple Vertical Borers, 20, 30, 42 and 60-in., any number of heads.

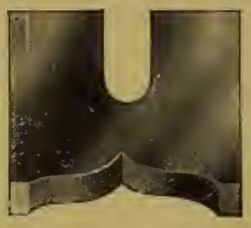
Band saws, 32, 36 and 38-in.
Borer, Andrew, 10-ft., 13-spindle, power table.
Borers, Andrew mult. vert., 20, 42 and 60-in., new.
Door clamp, Fay-Egan, heavy.
Door clamp, Jenkins-Hayes power-feed.
Edgers, two, three and four saws.
Glue cookers and retainers.
Jointers, 8, 12, 16, 20, 24 and 30-in.
Lathes, speed, eight, mounted on iron bed.
Lathes, turning automatic, Mattison No. 8 Yates No. 72, practically new.
Matcher, American Northwest, 24x8-in., 3 sides.
Matcher, 24x6-in., 3 and 4 sides.
Molders, 4-side, 9, 10 and 12-in. American.
Molder, Fay & Egan, 12-in. outside, heavy.
Mortiser, chain saw, New Britain No. 7, new.
Mortisers, F. & E. vertical, hollow-chisel; also plunger type; Greenlee vertical, double hollow-chisel.
Nailers, two, Hayes, 8-track, 8d, closed back.
Nailing machines, 2 closed back, 4-track, 4d, 15-in. spread, Hayes' make.
Pony planers, 16, 20 and 24-in.
Rip saws, self-feed, Hoosier, F. & E. Greenlee.
Rip saw, gang, Luther, for box work.
Router for stair stringers.
Sand belt, closet seat and similar work.
Sander, H. B. Smith, spindle and disc, practically new.
Sanders, 30- 42 and 54-in. Columbia; 30, 42 and 48-in. Invincible; 30 and 36-in. F. & E. double.
Saw, 8-ft. double cut-off, roller table.
Saws, combination and variety, single and double arbor, also tilting arbor, stationary and tilting table, 24 and 30-in. circular resaw.
Saw, circular re-slab, 40-in. blade, power feed rolls.
Shapers, Fay single-spindle reversible, also Shimer single with overhead routing attachment.
Shaper, Whitney No. 7 and 8 double-spindle, practically new.
Surfacer, 30-in. double, cabinet, B. & M., practically new.
Surfacer, Whitney 30-in. double, sectional roll and sectional chipbreaker; American No. 4½, 36-in. sectional and solid; Fay & Egan No. 140, 27 and 30-in. double divided rolls; also 18, 20, 24 and 30-in. single cylinder panel planers.
Tenoners, Fay & Egan double-end, also single-end.
Window frame machine for production work, new.
Window frame machines, Smith & Phillips combination.
Wood-worker, universal, Fay & Egan and Bentel & Margedant. One lot of glue room machinery.

We have just received two carloads of Band Saws and Jointers—all new—which are ready for immediate delivery.
Band Saws, 20, 26, 32, 36 and 38-in. Jointers, 8, 12, 16 and 24-in.

The Osborne & Sexton Machinery Co.
Re-manufacturers **COLUMBUS OHIO**



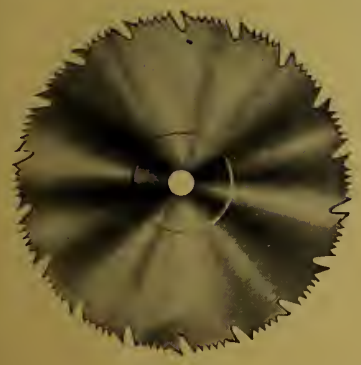
ATKINS
STERLING QUALITY
SAWS and KNIVES



mean continuous, efficient work and 100 per cent. production.

The extraordinary demand for more buildings and homes means that the Lumber output must increase.

Atkins Sterling Quality Saws and Knives will assist you in making the year 1920 the biggest and best in the history of your business.



Write to-day for our Knife Booklet "C W" and Pattern Template Paper.

E. C. ATKINS & CO.
Makers of Sterling Saws

Factory—HAMILTON, Ont. **Vancouver Branch—109 Powell Street**

More *than* Economy *and* Speed

A Battery of "Automatics" at Stickley's, Grand Rapids

THE Mattison Automatic Shaping Lathe produces turnings much faster and cheaper than is possible with hand methods or with old style machine equipment.

BUT of even greater importance is its flexibility which gives your designer free play in creating his designs. It faithfully reproduces all the historic round, square and octagon turned work, which plays so important a part in the new, distinctive patterns of today.

MATTISON
Automatic
The Standard Shaping Lathe
OVER 3000 IN USE

If it is worth while to bring out new patterns, isn't it just as important to give equal consideration to the best and most economical method of producing those patterns?

MATTISON MACHINE WORKS

Main Office and Works:

ROCKFORD, ILLINOIS

Branch Sales Offices:

CHICAGO
1735 Republic Bldg

NEW YORK
110 West 40th Street

GREENSBORO, N.C.
American Bank Bldg.

Volume Twenty-One TORONTO, APRIL, 1921 Number Four

CANADIAN WOODWORKER and Furniture Manufacturer

YOUR SALES

Increase with each Improvement in Quality

Your Profits Depend upon Speed of Production

The machine you buy for your edge shaping should have these desired attributes—**High Spindle Speed,** the kind that cuts cost of production.—**Freedom from Heating and Vibration,** the only means by which perfect edge shaping is attainable.

WHITNEY DOUBLE SPINDLE SHAPERS

have a regular working speed of 7,000 revolutions per minute, without tremor, vibration or heating, and mind you—they will keep up this speed continuously and produce the smoothest—cleanest kind of variety edge shaping.

Make inquiry of us, and let us convince you that the Whitney Shaper is the machine you want, to improve the quality of your product and boost sales.

BAXTER D. WHITNEY & SON, Inc., Winchendon, Mass.

H. H. Plummer & Co.,
553 Monadnock Bldg.,
San Francisco, Cal.

New York Office:
World's Tower Building,
110 West 40th Street.
C. L. Babcock, Manager.

Canadian Representatives:
H. W. Petrie, Limited,
Toronto, Ontario.

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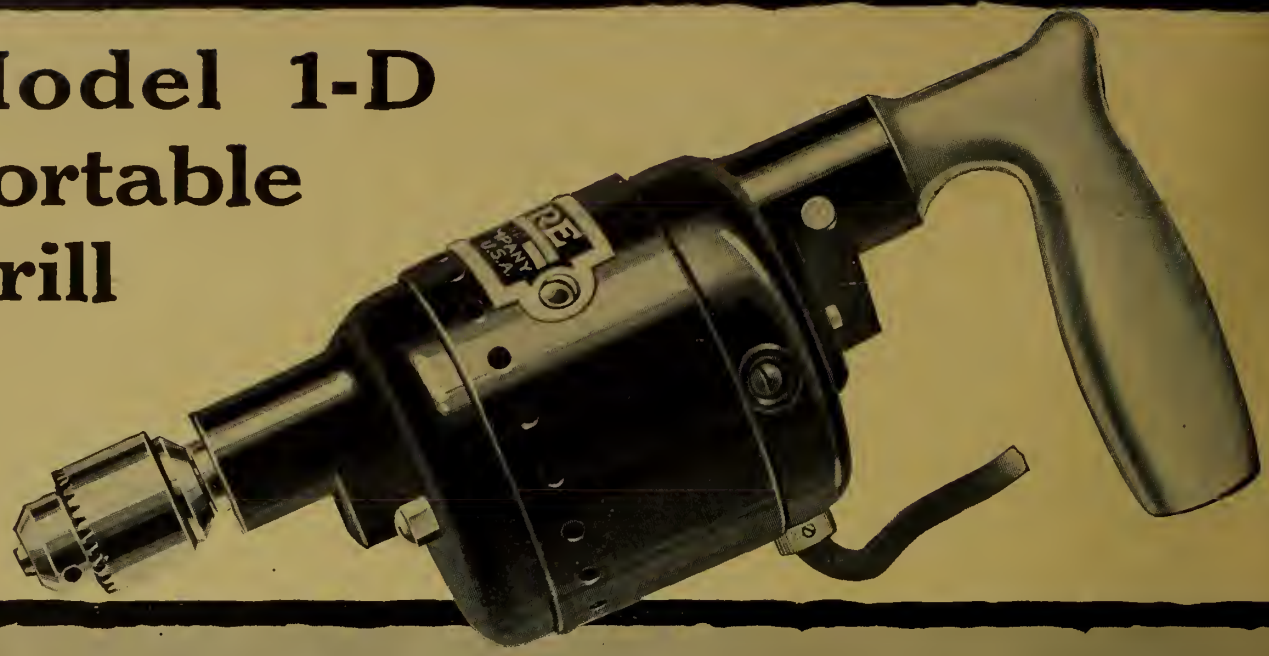
Model 1-D Portable Drill



HANDY—ECONOMICAL—EFFICIENT

Specifications:

Length—10 inches.

Weight—4¾ pounds.

Capacity—Steel, 0 to $\frac{3}{16}$". Wood and alloys, 0 to $\frac{1}{4}$".

Motor—Universal, on either direct or alternating current.

Diameter of Motor—3⅜ inches.

Spindle—Offset from center ¾".

Helical Gears.

Aluminum Handle.

Complete with 10-ft. cord, plug, switch and chuck.

Jacob's Chucks used as a regular equipment.

FOR speed in drilling and countersinking small holes, this tool is just what you need. It can be used on any kind of material—steel, iron, brass, aluminum or wood—and gives lasting service.

If your dealer cannot supply you with the Model 1-D, tell us about your requirements.

Wisconsin Electric Company
7134 Sixteenth Street, Racine, Wisconsin, U. S. A.

DUMORE GEARED ELECTRIC DRILLS

BUY THEM NOW

When Prices are Attractive

This is a special lot of second hand machinery we are offering for quick sale. Machines are all in stock in our warehouse, and every one is guaranteed in good working order. You can inspect them, or we will send full particulars on request.

1—McGregor-Gourlay Double Arbor Universal Saw Table, same as C.M.C. No. 618, with 14″ saws, self-contained countershaft, full complement of gauges, saws, wrenches, etc.

1—Ditto as above.

1—Preston No. 127 Variety Saw Table, countershaft attached, one 14″ saw.

1—Ballantine 36″ Band Saw, with solid lower wheel, complete with saw blades, wrenches, etc.

1—Ballantine Two Spindle Shaper, Spindles 20½″ centres, diameter of spindles where collars go on 1⅛″, top 42″ x 42″.

1—American No. 1 Single Spindle Shaper. Fig. 937 with plain countershaft.

1—C. M. C. No. 507 Mortiser, with boring attachment.

1—C.M.C. No. 624 Hand Feed Rip Saw Machine, with self-contained counter shaft, table 6'6″ long by 40″ wide, with plain box gauge, 22″ saw blades, 1¼″ arbor with cone for receiving saws different diameter.

1—Ballantine 8″ Four Sided Moulder, complete with square heads and straight knives on all heads.

1—American No. 2½ Single End Tenoner, with two copes and cut-off saw attachment. Fig. 9431 in American Woodworking Machinery Catalog.

1—Ballantine 16″ Buzz Planer with square cylinder, full set of knives and countershaft.

1—C.M.C. No. 646 Roller Table Cut-off Saw, sliding table 7'6″ long, stationary table 50″ to the saw, sliding table equipped with stop gauge, including five stops, with countershaft, complete with saws, wrenches , etc.

1—Yates No. 156 27″ by 6″ Single Surfacer with solid roll and chipbreaker, full set of knives, wrenches and countershaft.

1—Cowan Combination Vertical and Horizontal Boring Machine, complete with wrenches, etc.

1—Wood Frame Belt Sander, complete with roller table.

1—Hespeler 12″ Buzz Planer, fitted with round cylinder, full set of knives, countershaft, wrenches, guard, etc.

1—Ballantine Tilting Table Double Arbor Saw Table, same as C.M.C. No. 616, arbor raising and lowering, fitted with full set of gauges, countershaft, saws, etc.

1—Preston 36″ Band saw, lower web wheel and guards.

1—McGregor-Gourlay Variety Saw Table with countershaft attached, guard, gauges, tilting table, wrenches, etc.

8—Sections Cowan Four Screw Veneer Press 12″x50″, four sections 27″ clear space under screw plates, four sections 32″ under screw plates.

1—24″ Francis Double Roll Glue Spreader.

4—Sections Cowan Three Screw Veneer Press 38″x12″, 28″ clear space under screw plates.

1—American No. 4½ Single Surfacer, with solid roll and chipbreaker.

1—American No. 26, 10″ Outside Moulder, 4″ side heads, latest type machine, complete with knife jointers and all equipment, new straight knives on all four heads.

1—C.M.C. Arm Sander, No. 438, with paper cutter.

1—Universal Knife Grinder, 37″, made by American Wood Working Machinery Co., Fig. 1126 in their catalogue.

1—60″ Sturtevant Single Slow Speed Exhauster, left hand, top vertical discharge, complete with platform and rods to suspend from ceiling.

1—Pair 24″ Pulleys.

1—18″ Filing Vise.

1—Foley Band Saw Setter.

The last three items for use in sharpening small size Band Saws.

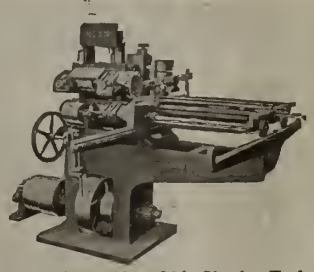
American No. 25 Power Feed Edging and Ripping Saw

Garlock-Walker Machinery Co., Limited

32 Front Street West

WINNIPEG TORONTO MONTREAL

Everything in Woodworking and Metal Working Machinery



American No. 2½ Single End Tenoning Machine

A Sturdy Motor for Severe Service

Wound rotor type or slip ring induction motors are recommended for loads requiring very heavy starting torque or where gradual acceleration is necessary as well as for variable speed service.

Canadian Crocker-Wheeler wound rotor machines, like the squirrel cage type, are built mainly to meet severe service conditions. They embody the most modern electrical design and sturdy mechanical construction, with especially large bearings.

Our nearest House will give full technical data and recommendations on any of your motor requirements.

Northern Electric Company
LIMITED

Montreal Quebec Toronto London Regina Edmonton
Halifax Ottawa Hamilton Windsor Winnipeg Calgary Vancouver

G-2 Will Do It. From the time stock is fed into the machine until the saw has completed the cut, it **must** follow an absolutely straight line. There is no alternative. The G-2 will rip anything from basswood to lignum-vitae straight and true as a die.

The G-2 is making good wherever installed. Why? Because they deliver the goods and keep on doing it. Manufacturers all over the country are using them. There are many features but the one that counts most is the absolutely straight cut secured under all conditions.

It would be worth your while to look into the possibilities of this machine whether you contemplate buying or not.

We have a circular which explains fully.
May we send you one?

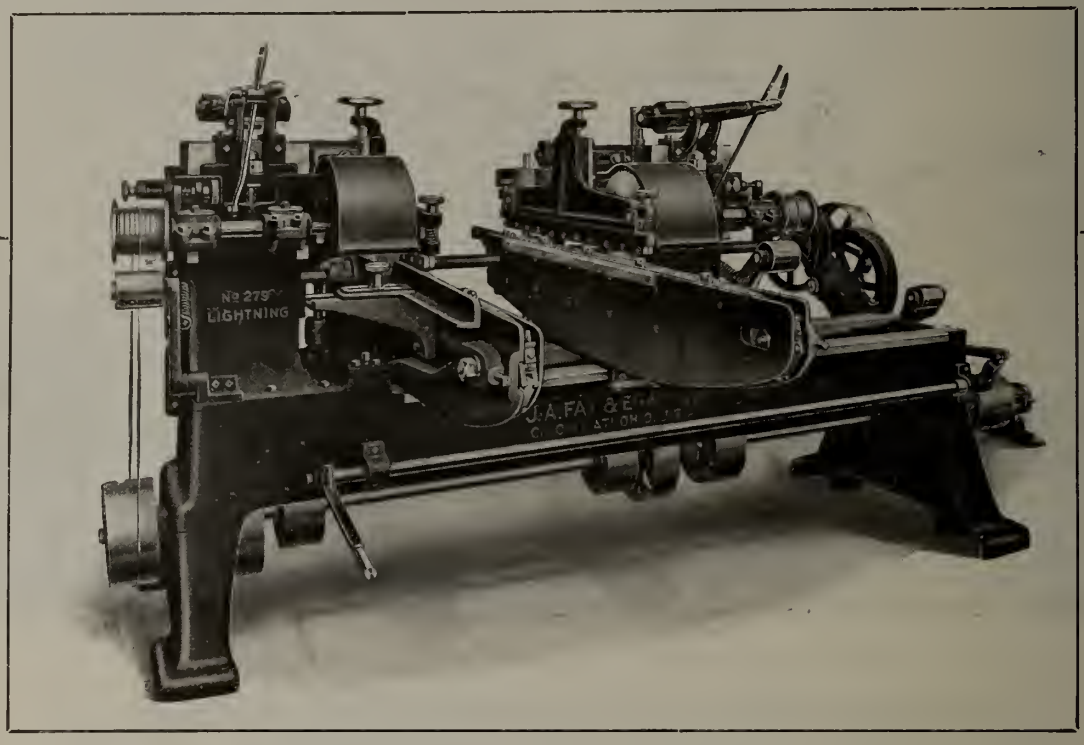
P. B. Yates Machine Co. Limited

Hamilton - Canada

Control Your Manufacturing Costs

by installing a

No. 279 "Lightning" Double End Tenoner



There are many jobs now being worked on Shapers, Gainers, saws, etc., which could be done better and more cheaply on a No. 279.

No. 279 was designed for cutting tenons, coping and cutting off to exact dimensions both ends of material at one operation.

This machine is not only a modern fast-feed Tenoner—it is an up-to-date Automatic Double Cut-Off and Equalizing Saw as well.

As a Tenoner, it is distinctive in that it is entirely self-contained, all operating parts being driven from a single countershaft in base of the machine greatly economizing floor space.

Send for Special Bulletin 1-16 for full information about this wonderful and labor-saving machine.

J. A. Fay & Egan Company

ESTABLISHED 1830

World's Oldest and Largest Manufacturers of Woodworking Machinery

153-173 West Front Street, Cincinnati, Ohio

SIXTY YEARS

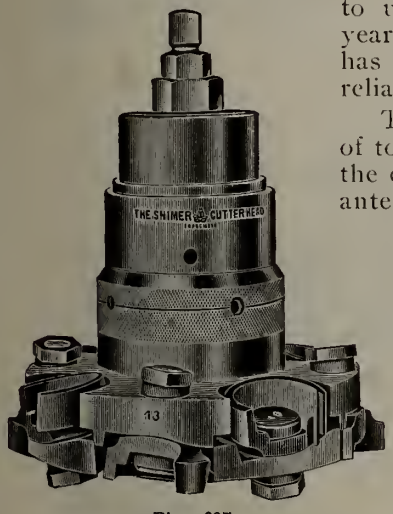


Fig. 627

The name "Shimer" has been quite familiar to users of woodworking machinery for sixty years. The reputation of Shimer Cutter Heads has withstood the severe test of time, and their reliability is unquestioned.

The cutter shown is turned to cut the shape of tongue and groove desired, so that to sharpen the cutter, it is filed or ground on its face, guaranteeing the user the same shape of cut during the life of the cutter. The cutter being fastened to a concave seat on a compound angle, assures the user of the proper clearance of cutters, consequently they never burn.

These heads are fitted with or without self-centering sleeve, and made expansion or solid, to suit the customer's wishes.

Write for Catalogue.

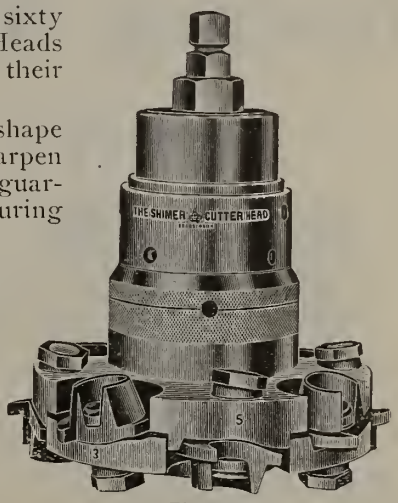


Fig. 628

SHIMER CUTTER HEAD CO. OF CANADA, LIMITED

Manufacturers of Cutter Heads, Safety Cylinders and Grinders

GALT, ONTARIO

Inexpensive
Labor Saving
Money Making

These are a few of the good points of the

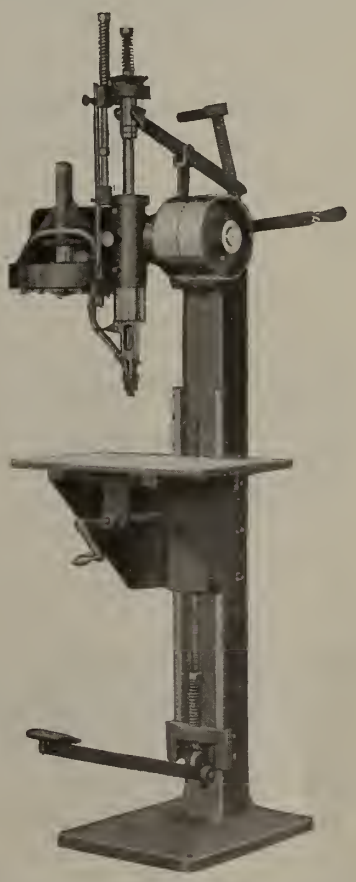
Reynolds Magazine Fed Screw Driving Machine

Manufacturers who have been using the REYNOLDS are now wondering how they ever managed without it.

This is the machine that drives from 800 to 1200 screws per hour, and in certain classes of work as high as 2000 screws per hour have been driven.

A gross of screws (either wood or machine) is poured into the hopper and the machine does the rest.

Send us dimensions of your work and gauge length of screws and we will send complete description of machine for your needs.

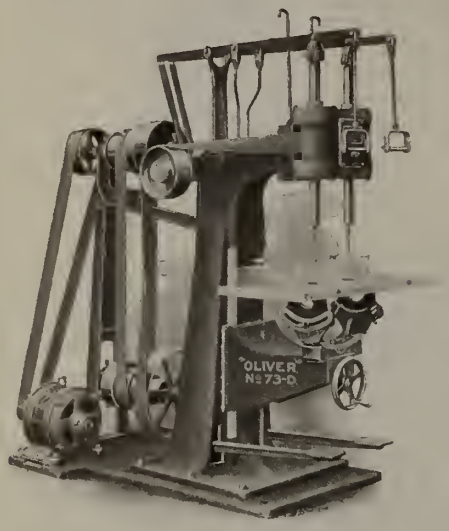


The Reynolds Machine Co.

Department C

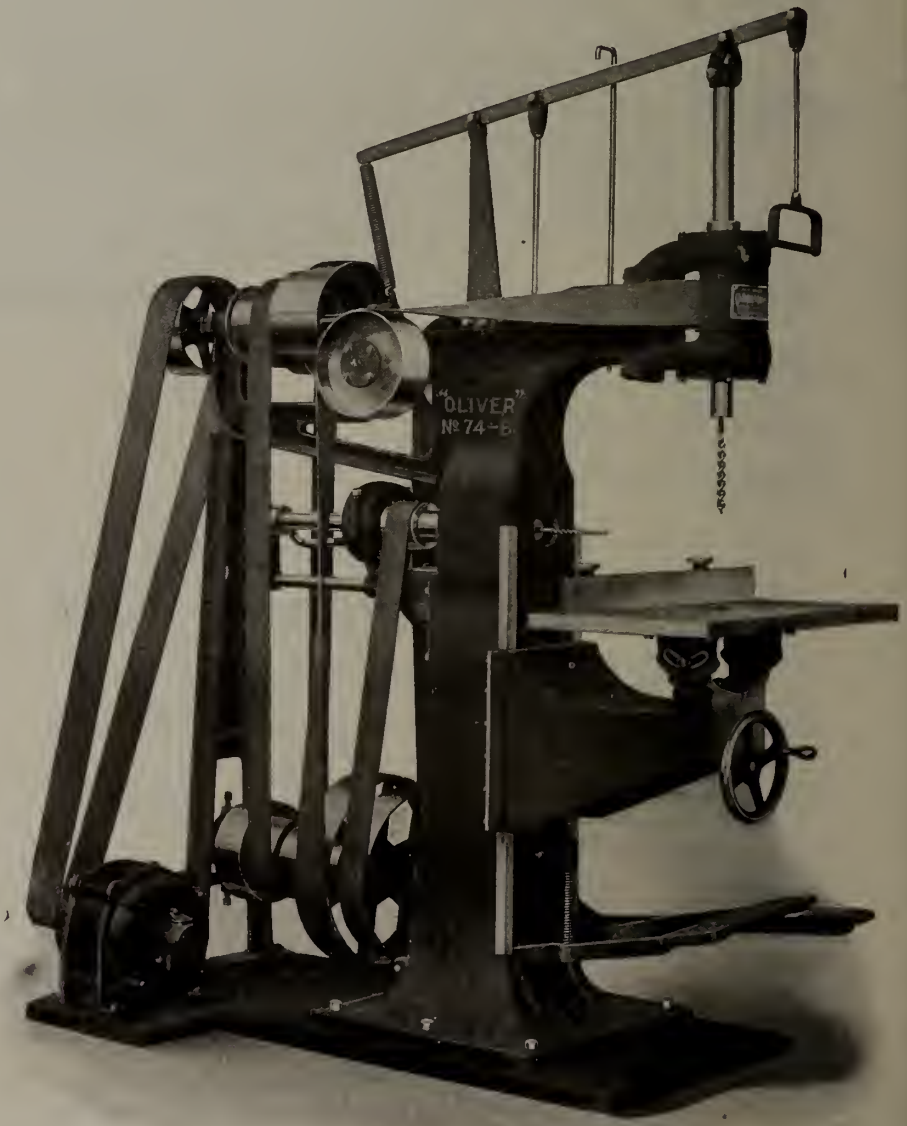
Massillon, Ohio, U. S. A.

"Oliver" Boring Machines



Because the Best is none too good

"Oliver" Boring Machines are built variously with one or two vertical boring spindles and with or without horizontal boring spindle.



All "Oliver" Boring Machines have high speed ball bearings. Various motor or belt drives are applicable.

These machines are durable, accurate and are especially designed for production work.

High Grade Woodworking Machinery

Oliver Machinery Company

Grand Rapids
Michigan, U.S.A.

C.M.C.

Iron and Woodworking Machinery

ANNOUNCEMENT

OUR Toronto Sales Staff are now located in offices in (Bank of Hamilton Building, Rooms 721-722), where they will be glad to see our customers or have them communicate by telephone

NUMBER MAIN 475.

All enquiries will receive prompt and careful attention.

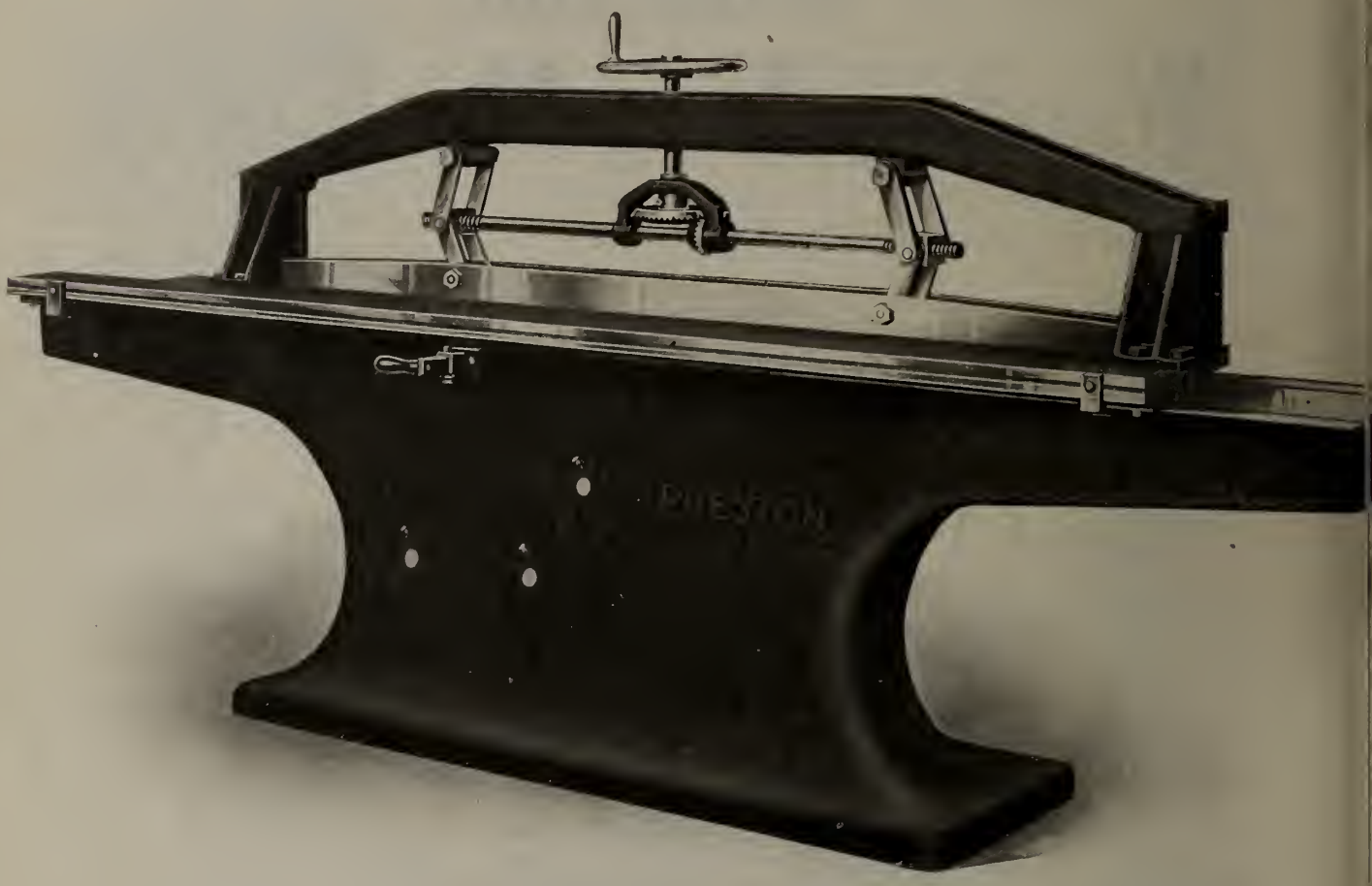
CANADA MACHINERY CORPORATION
LIMITED

Head Office: GALT, ONTARIO

The only

VENEER JOINTER

that will effectively joint buckled veneer



No. 181 "Preston" Veneer Jointer

THIS MACHINE was designed and built for the purpose of making commercially perfect face joints butt or crosswise as well as lengthwise of the grain on the highest figured circassian walnut or crotch mahogany veneer.

One of the most essential features of a machine of this kind is RIGIDITY. Examination of the frame or column on above illustration will show the massive construction of same which is of cored section and cast in one solid piece. This guarantees absolute accuracy in the table Vee ways at all times, thus contributing to a perfect joint being made on straight or curly stock at one operation.

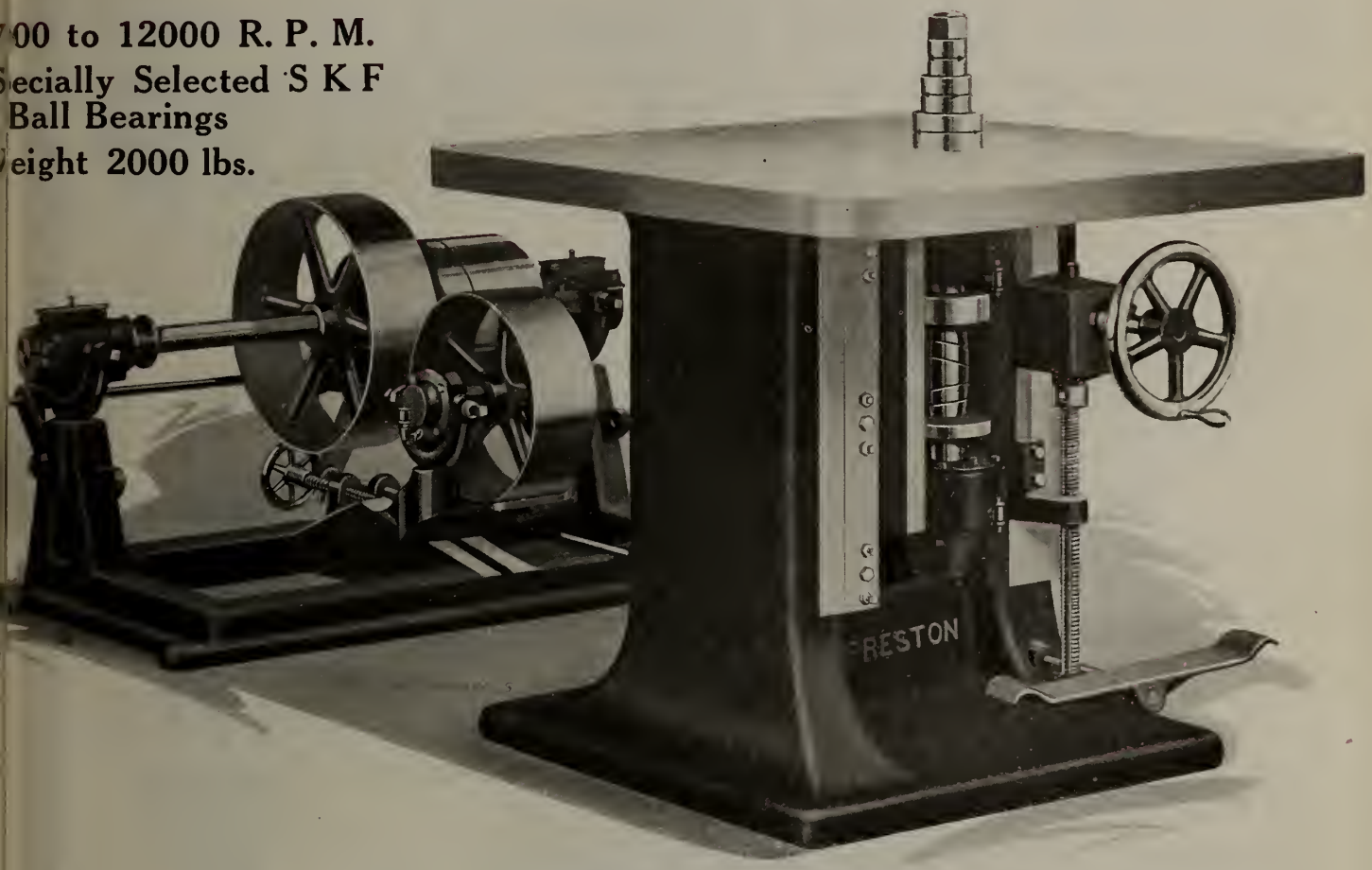
The Preston Woodworking

We are the Sole Manufacturers and Agents in Canada of the Eaglesfield Patented Beltless Swing Saw—See advertisement page 17.

Don't Waste Time

by having a shaper in your plant which is not 100% efficient

'00 to 12000 R. P. M.
ecially Selected S K F
Ball Bearings
eight 2000 lbs.



Cut showing machine with single spindle

"Preston" No. 162 High Speed Ball Bearing Shaper

Built with either one or two spindles

It may be that now when things are a bit slack is the best time to arrange and re-arrange your plant to receive the maximum of efficiency from both men and machines. If we can be of any assistance in helping you plan or suggest means by which this can most economically be arranged, write us.

Machinery Company, Ltd.

PRESTON, ONTARIO

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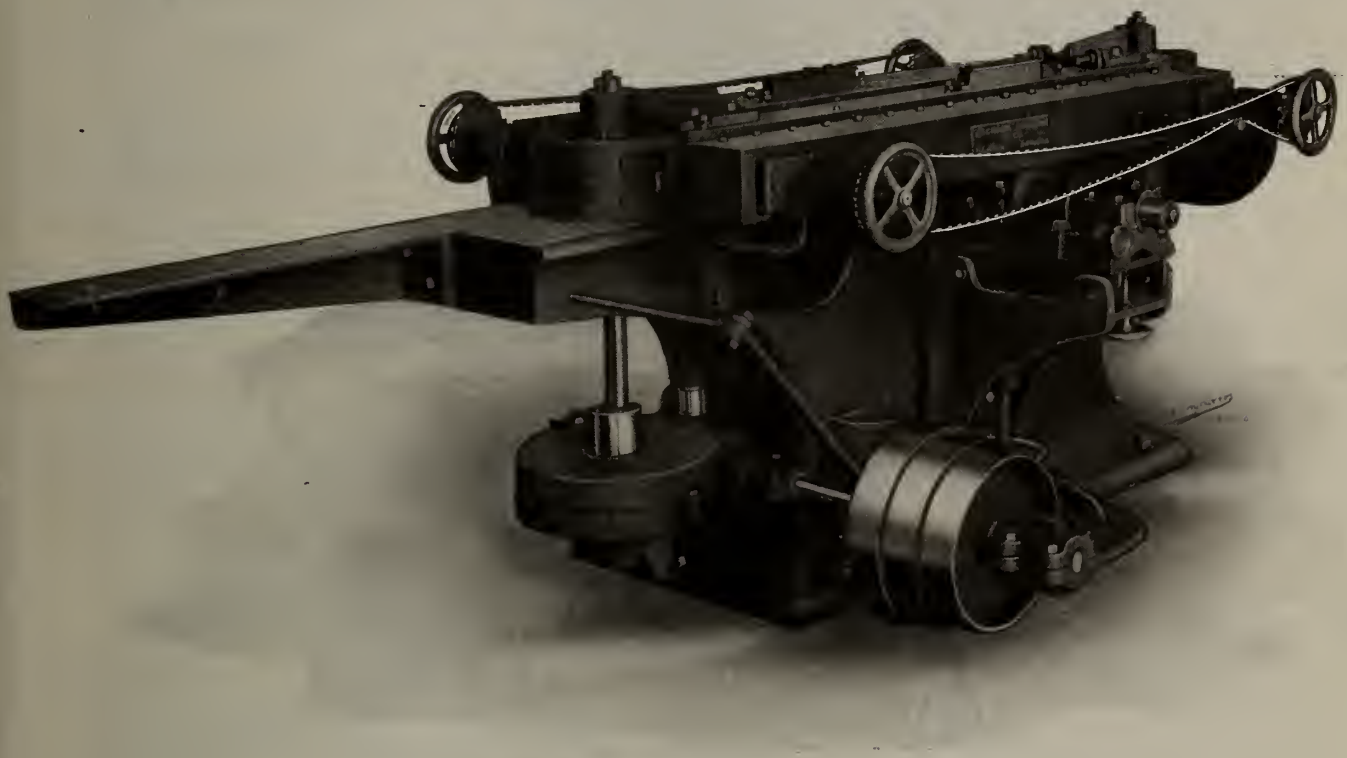

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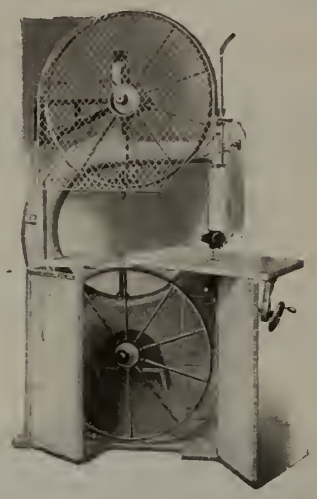

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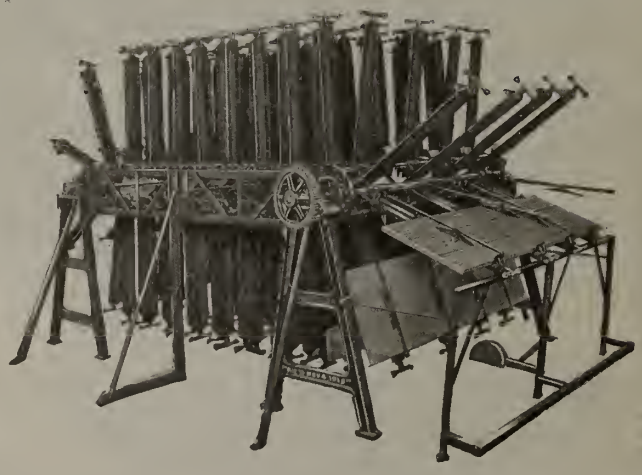

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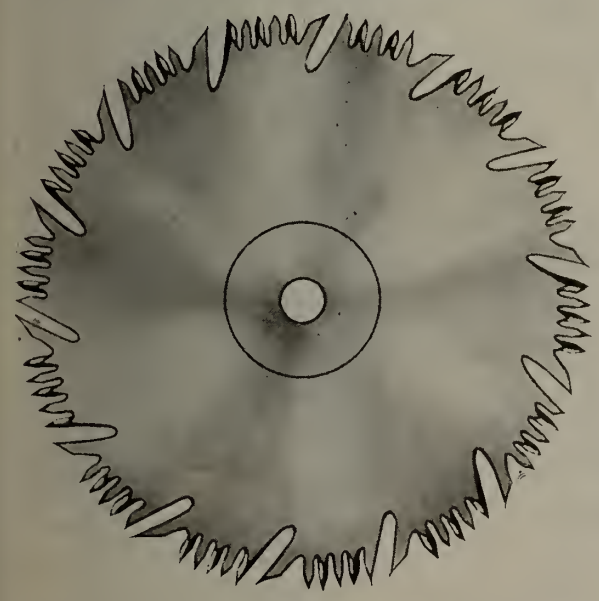

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KILNS

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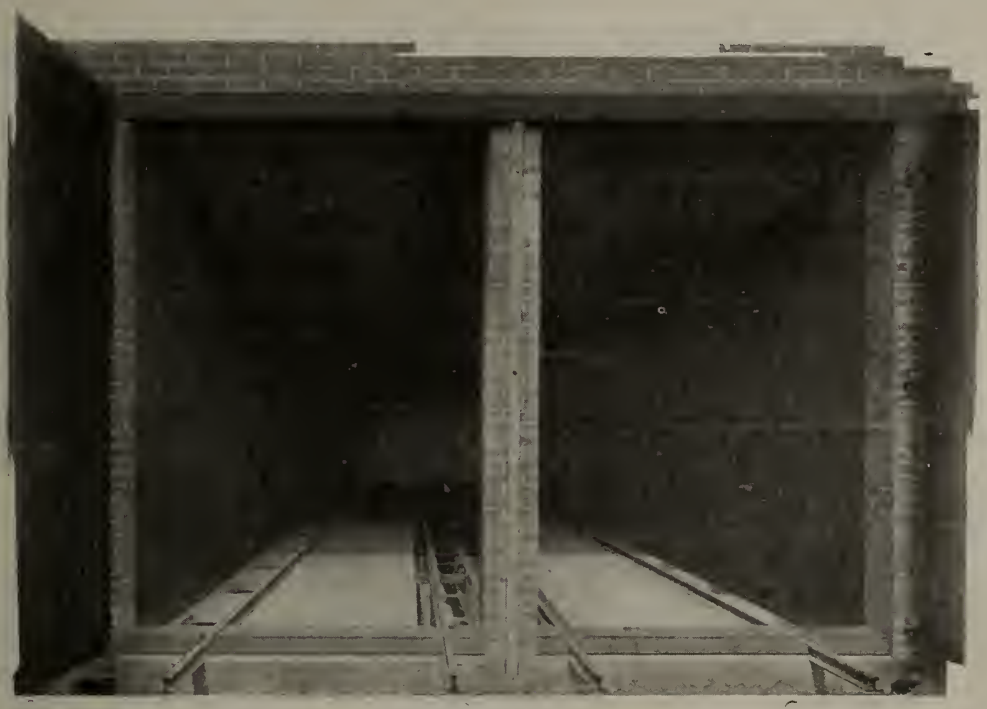

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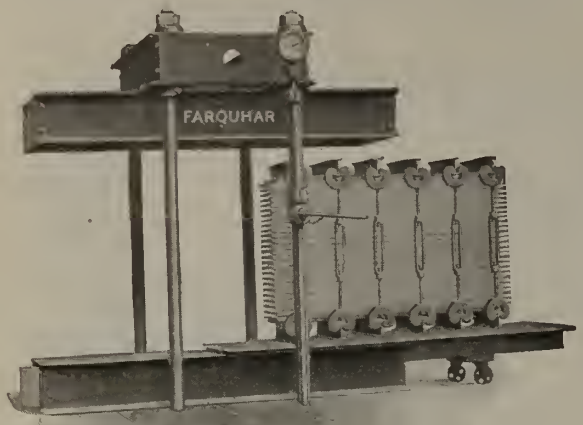

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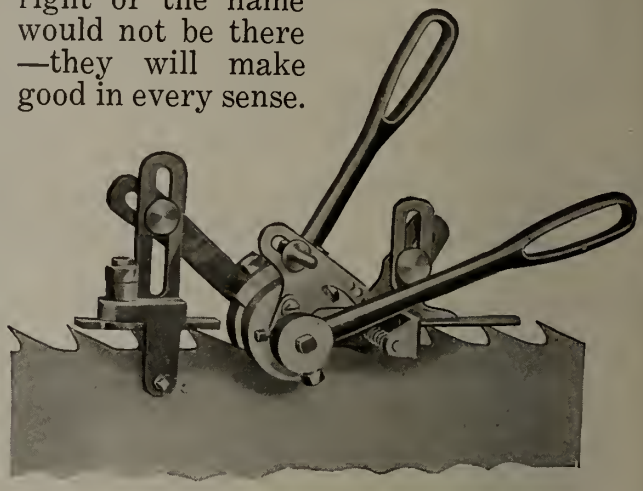

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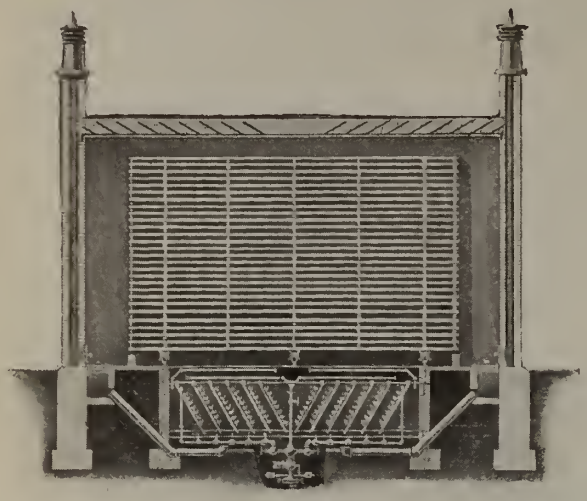

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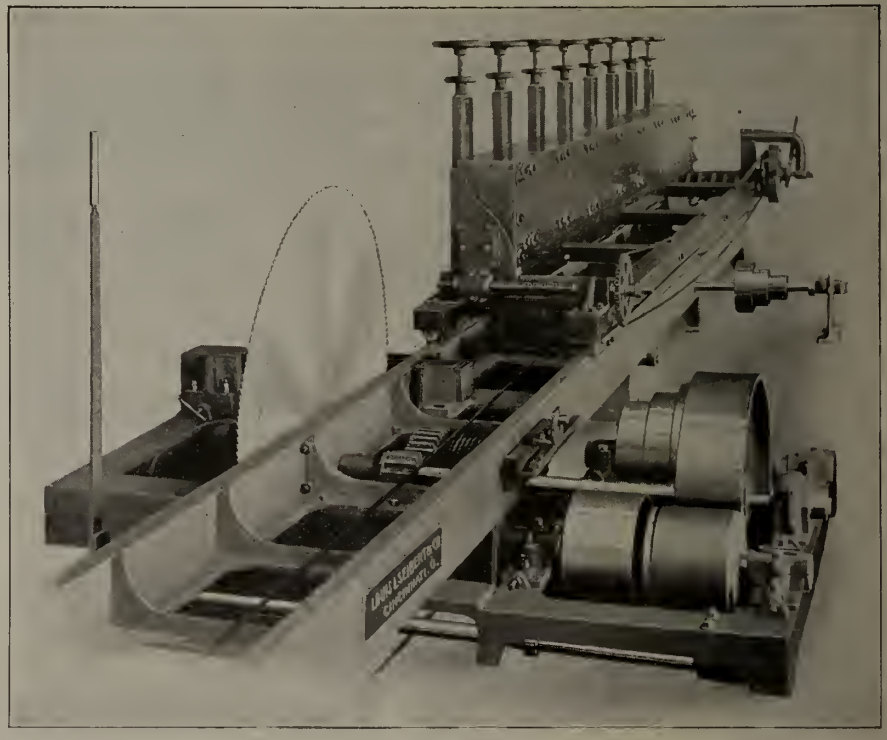

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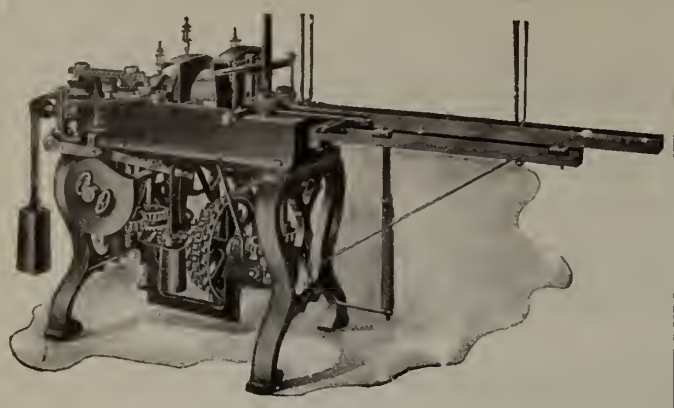

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4/4 Birch	No. 1 C & B	or	No. 2 C & B
6/4 Birch	No. 1 C & B	or	No. 2 C & B
8/4 Birch	No. 1 C & B	or	No. 2 C & B
10/4 Birch	No. 1 C & B	or	No. 2 C & B
12/4 Birch	No. 1 C & B	or	No. 2 C & B

4/4 6/4 8/4 Basswood ....No. 2 C & B
4/4 and 12/4 Maple ....No. 2 C & B
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Dry Lumber in Buffalo for Quick Shipment

TENNESSEE SCENTED CEDAR

1 in. 92,700′ No. 1 Com. & Btr.
1¼ in. 5,000′

CHERRY

	1&2	Clear Strips	No. 1 Com.	No. 2 Com.
1 in.	157,500	200	182,200	128,500
1¼ in.	3,500	......	21,600	2,500
1½ in.	10,000	......	37,700	26,300
2 in.	7,000	......	21,200	64,900
2½ in.	6,500	......	3,700	2,200
3 in.	28,700	......	3,500	3,300
4 in.	5,900	......	......	500

CHESTNUT

	1&2	Clear Strips	No. 1 Com.	S.W.& No. 2 Com.
¾ in.	1,000	......	51,000	103,000
1 in.	......	665	4,300	163,500
1¼ in.	171,800	300	89,200	199,200
1½ in.	51,500	......	52,000	......
2 in.	22,200	......	17,300	126,200
2½ in.	4,000	......	1,500	500
3 in.	2,100	......	1,300	500
4 in.	1,500	......	300	......

PLAIN RED GUM

		1&2	No. 1 Com.	No. 2 Com.
1 in.	......	25,300	13,000	15,500
1¼ in.	......	......	325	......
1½ in.	......	......	4,300	9,500
2 in.	......	......	......	7,500

QUARTERED RED GUM

	1&2	No. 1C	No. 2C
4/4	6,000	20,000	12,100
5/4	5,100	3,800	......
6/4	3,900	4,500	......
8/4	19,100	7,500	3,600

QUARTERED SAP GUM

	1&2	No. 1C	No. 2C
4/4	......	2,500	12,000
5/4	14,000	......	......
8/4	2,000	......	......
10/4	350	24,000	3,000

SAP GUM

		1&2	No. 1 Com.	No. 2 Com.
1 in.	......	3,400	6,000	200
1¼ in.	......	......	400	......
1½ in.	......	2,400	6,000	13,500
2 in.	......	......	5,700	10,400
2½ in.	......	......	......	......

PLAIN RED OAK

⅜ in.	24,200	......	......	......
¾ in.	104,000	......	124,000	33,200
⅝ in.	......	......	84,000	53,600
1 in.	95,200	3,550	133,000	142,400
1¼ in.	90,700	2,400	13,000	......
1½ in.	168,900	4,300	68,200	40,000
2 in.	148,100	......	180,800	71,000
2½ in	78,100	......	24,000	3,700
3 in.	28,800	......	20,500	7,000
4 in.	18,600	......	8,900	......

PLAIN WHITE OAK

	1&2	Clear Strips	No. 1 Com.	No. 2 Com.
⅝ in.	10,150	......	500	16,900
¾ in.	142,900	......	251,000	83,000
1 in.	16,300	1,700	129,000	85,200
1¼ in.	28,300	......	4,500	5,000
1½ in.	111,500	......	72,000	18,000
2 in.	94,000	......	131,000	65,000
2½ in.	176,800	......	56,500	3,000
3 in.	106,800	......	65,800	14,400
3½ in.	5,500	......	3,000	1,500
4 in.	77,000	......	22,500	6,000

QUARTERED RED OAK

	1&2	Clear Strips	No. 1 Com.	No. 2 Com.
¾ in.	1,700	......	9,700	400
1 in.	24,200	5,400	10,500	1,400
1¼ in.	3,000	......	3,000	500
1½ in.	......	......	......	......
2 in.	1,000	......	7,400	......

QUARTERED WHITE OAK

	1&2	Clear Strips	No. 1 Com.	No. 2 Com.
½ in.	6,500	......	......	......
¾ in.	550	300	23,600	9,000
⅝ in.	2,800	......	5,500	800
1 in.	57,400	18,000	61,400	27,000
1¼ in.	700	......	300	......
1½ in.	3,500	......	400	......
2 in.	......	......	25,100	5,700
2½ in.	1,000	......	......	......

POPLAR

	1&2	No. 1 Com.	No. 2 Com.	Bright Sap
⅝ in.	10,800	41,300	600	20,800
1 in.	42,000	208,900	127,000	23,200
1¼ in.	4,300	700	30,000	4,000
1½ in.	......	17,000	20,500	......
2 in.	6,600	5,500	24,500	1,800
2½ in.	4,800	......	......	......
3 in.	30,900	12,000	47,000	3,600
4 in.	......	......	450	......

BLACK WALNUT

		1&2	No. 1 Com.	No. 2 Com.
1 in.	......	1,200	......	14,400
1¼ in.	......	2,200	21,300	1,200
1½ in.	......	125	200	100
2 in.	......	100	4,500	1,900
2½ in.	......	......	145	45
3 in.	......	110	50	250
4 in.	......	......	500	1,200

Also Large Stocks of Ash, Basswood, Beech, Birch, Hard and Soft Maple.

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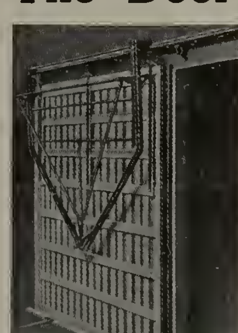

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Carrier lifts door clear of kiln and carries it down track. Returning, deposits door to rabbeted joint, where it is held steam-tight by its own weight. Applicable to old or new kilns.
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11,000′	4/4	No. 2 C&B	
BROWN ASH			
60,000′	4/4	No. 1 C&B	
16,000′	6/4	No. 1 C&B	
8,900′	8/4	No. 1 C&B	
BASSWOOD			
75,000′	4/4	Sel. & Fas.	
100,000′	4/4	No. 1 & 2. Com.	
75,000′	6/4	No. 1 Com. & FAS	
50,000′	6/4	No. 2 Com.	
40,000′	8/4	No. 1 C&B	
MAPLE			
75,000′	4/4	Log Run	
BEECH			
65,000′	4/4	Log Run	
BIRCH			
30,000′	4/4	FAS	
90,000′	4/4	No. 1 Com.	
150,000′	4/4	No. 2 Com.	
30,000′	5/4	No. 1 Com. & FAS	
45,000′	6/4	FAS	
60,000′	6/4	No. 1 Com.	
75,000′	6/4	No. 2 Com.	
100,000′	8/4	Sel. & Fas.	
150,000′	8/4	No. 1 Com.	
100,000′	8/4	No. 2 Com.	
75,000′	10/4	Sel. & Fas.	
125,000′	10/4	No. 1 Com.	
250,000′	12/4	Sel. & Fas.	
100,000′	16/4	Sel. & Fas.	
SOFT ELM			
45,000′	4/4	No. 2 C&B	
21,000′	6/4	No. 1 C&B	
22,000′	8/4	No. 1 C&B	
150,000′	4/4	Basswood, Birch, Ash, Elm Under National Rules.	No. 3 Com.

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Plain, Straight and Spiral Grooved

"Canada Wood" dowels are manufactured from high-grade Maple, Birch, Beech or White Oak, uniform in length and nicely pointed, quality guaranteed.

We also manufacture Bailwoods and Variety Turnings in all styles, sizes and descriptions, in the plain, or Enamelled in Black, Natural Wood or Mahogany finishes. Three-eighth in. Maple, Birch and Quarter Cut White Oak Flooring a Specialty. Broom and Mop Handles of every description.

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Rock & Soft Elm
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Basswood
Hardwood, in 4x4, 4x6, 1" & 2" No. 3 Com.

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Stock on Hand in Kitchener for Immediate Shipment

3,000	ft.	4/4 x 10 in. and up Qt'd White Oak Fas.
12,000	"	4/4 x 6 in. and up Qt'd White Oak Fas.
15,000	"	4/4 x 6 in. and up Qt'd White Oak No. 1 com.
2,680	"	3/4 x 13/17 Sap Gum Fas.
4,700	"	3/4 x 3/12 Sap Gum No. 1 Com.
400	"	5/4 x 6 in. Plain red Gum Fas.
4,000	"	4/4 x 6 in. up Sap Gum No. 1 Com.
5,000	"	8/4 x 6 in. up Qt'd red Gum C. & B.
8,000	"	5/4 x 6 in. Plain White Oak Fas. ... ...
2,000	"	6/4 x 4 in. Plain White Oak No. 1 Com.
15,000	"	6/4 x 6 in. Plain red Oak Fas.
10,000	"	8/4 x 6 in. Plain red Oak Fas.
25,000	"	8/4 x 4 in. Plain red Oak No. 1 Com.
12,000	"	4/4 x 3 in. Tenn. Red Cedar No. 1 C. & B.
25,000	"	8/4 Sound Wormy Chestnut
2,000	"	5/4 Sount Wormy Chestnut
32,000	"	6/4 Sound Wormy Chestnut
5,000	"	4/4 Chestnut No. 1 C. & B.
10,000	"	5/4 Chestnut No. 1 C. & B.
10,000	"	6/4 Chestnut No. 1 C. & B.
43,000	"	4/4 Soft Elm No. 3 C. & B.
1,000	"	4/4 Soft Elm No. 3 Common
12,000	"	8/4 Soft Elm No. 2 C. & B.
15,000	"	12/4 Soft Elm No. 2 C. & B.
5,285	"	12/4 Oak No. 2 Common & Better
6,000	"	12/4 Oak No. 2 and 3 Common
12,000	"	4/4 Hard and soft Maple No. 3 C. & B.

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Brought from the inland recesses of the tropics, from the thick matted jungles where vivid flowers, and magnificent orchids grow in riotous profusion, where monkeys chatter incessantly, and birds of beautiful plumage dwell and strange creatures cry out in the night.

These piles represent the toil of natives of the jungle, and many miles of ocean travel to the land of the white man

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QUARTERED RED GUM

8 cars 2½" Common and Better.
5 " 3" Common and Better.
8 " 1¼" Common
8 " 2" Common.

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6 cars 2½" Common & Better.
3 " 3" Common and Better.
5 " 2" Common and Better.

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10 cars 1" No. 1 Com. and Btr., White, Pln.
10 " 1" No. 1 Com. and Btr., Red, Qtd.
2 " 1½" 1sts & 2ds Qtd. White.

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Rotary-Cut Soft Yellow Poplar Veneers
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It is a pleasure, as always, in this period of renewed activity to give to our patrons the scientific service and a maximum value, which it is ever our aim to secure to them.

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CYPRESS
1 car 4/4 Shop & Btr.

ELM
3 cars 6/4 Log Run
1 car 8/4 Log Run
1 car 12/4 Log Run

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1 car 5/4 Com. & Btr.
2 cars 4/4 No. 1 Common
2 cars 4/4 No. 2 Common

QTD. RED GUM
2 cars 4/4 No. 1 Common
1 car 6/4 F.A.S.
1 car 6/4 No. 1 Common
1 car 8/4 Com. & Btr.

QTD. RED GUM S.N.D.
2 cars 8/4 No. 1 & Btr.
1 car 10/4 No. 1 & Btr.
1 car 12/4 No. 1 & Btr.

PLAIN SAP GUM
1 car 4/4 F.A.S.
3 cars 4/4 No. 1 Com.
3 cars 4/4 No. 2 Com.
2 cars 4/4 No. 3 Com.
1 car 5/4 Com. & Btr.
2 cars 5/4 No. 2 Com.
1 car 5/4 No. 3 Com.

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1 car 4/4 No. 2 Com.

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HICKORY
1 car 6/4 Log Run

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2 cars 4/4 No. 1 & Btr.
3 cars 4/4 No. 1 Com.
1 car 4/4 No. 2 Com.
1 car 4/4 2½ to 5½ Cl. Strips
1 car 4/4 1½ to 3 Com. Strips.
2 cars 5/4 No. 1 & Btr.
1 car 6/4 No. 1 Com.

PLAIN WHITE OAK
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1 car 4/4 No. 2 Com.
1 car 4/4 No. 1 Com. & Btr. Sound Wormy
1 car 5/4 No. 1 Com. & Btr.
1 car 5/4 No. 1 Com.
1 car 6/4 No. 1 Com.
1 car 5&6/4 No. 3 Com.

PLAIN RED OAK
3 cars 3/4 No. 1 Com. & Btr.
1 car 4/4 No. 1 Com. & Btr.
3 cars 4/4 No. 1 Com.
2 cars 4/4 No. 2 Com.
2 cars 5/4 No. 1 Com. & Btr.
1 car 5/4 No. 1 Com.
1 car 6/4 No. 1 Com. & Btr.

POPLAR
1 car 4/4 F.A.S.
1 car 4/4 Saps & Select
2 cars 4/4 No. 1 Com.
2 cars 4/4 No. 2 Com.
1 car of Dogboards.

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SAP GUM

PLAIN AND QUARTERED

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For Furniture and Panels

Plain Red Oak
For Interior Trim and Doors

Cypress
For Battery Separators

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Quality Unsurpassed

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BRUCE
LITTLE ROCK

WHITE OAK

of excellent quality
and expert manufacture.

Also

RED OAK
ASH · GUM

All Band Sawn

Produced in our new hardwood mill at Little Rock, Arkansas. The last word in modern equipment.

We can ship Oak Flooring, Square-Edged Parquetry Strips, Trim and Moldings with Hardwood lumber—a service of unusual advantage to the trade.

Write Now

E. L. BRUCE COMPANY
LITTLE ROCK
HARDWOOD PLANT, Little Rock
FLOORING PLANTS, Little Rock and Memphis

Look for this Brand **B.H.** *on the end of each Board*

It Means Satisfaction

BROWN & HACKNEY, INC.

Manufacturers of High Grade Southern Hardwood

LUMBER

Band Mill: Little Rock, Ark. *Offices: Memphis, Tenn.*

Eastern Representative

Chas. T. McManus, 307 Brisbane Bldg., Buffalo, N.Y.

Are You Prepared For a Lumber Famine?

THE present situation among manufacturers, according to market reports, shows that Hardwood Stocks are far short of normal.

To those in close touch with the Lumber industry, there are positive signs pointing to a change in the lumber situation—values are bound to stiffen.

Prices are now at rock-bottom—this will not last. A sudden demand will shoot prices up again.

Just look over YOUR requirements for Birch, Basswood, Hard Maple, or Elm, now—and get quotations from us without delay.

Sawyer Goodman Company

Marinette - Wisconsin

Stimson Veneer and Lumber Co.

(Inc.)

Office and Mill: McLean Ave. and Union Belt R.R.

Memphis - Tenn.

We sell only the product of our own mills and make band sawn lumber in all Southern Hardwoods.

We specialize in Quartered White Oak, Red Oak, and Red Gum.

With allied companies we make fifty million feet annually.

J. V. Stimson Hardwood Co.

Manufacturers and Exporters

Band Mills: Memphis, Tenn., Helena, Ark.

Memphis - Tenn.

STOCK LIST

QUARTERED WHITE OAK
- 3 cars 4/4" 1s and 2s.
- 5 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common .

QUARTERED RED OAK
- 5 cars 4/4" 1s and 2s.
- 10 cars 4/4" No. 1 Common.
- 4 cars 4/4" No. 2 Common.
- 2 cars 6/4" No. 1 Common and Better.

QUARTERED RED GUM
- 10 cars 4/4" 1s and 2s.
- 3 cars 4/4" 1s and 2s Fig.
- 2 cars 5/4" 1s and 2s.
- 2 cars 6/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 2 cars 5/4" No. 1 Common.
- 2 cars 6/4" No. 1 Common.

QUARTERED RED GUM, Sap no Defect
- 5 cars 6/4" No. 1 Common and Better.
- 10 cars 8/4" No. 1 Common and Better.

ASH
- 4 cars 10/4" No. 1 Common and Better.
- 1 car 12/4" No. 1 Common and Better.
- 1 car 6/4" No. 1 Common and Better.
- 2 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common.

SAP GUM
- 10 cars 4/4" 1s and 2s.
- 20 cars 4/4" No. 1 Common.
- 10 cars 4/4" No. 2 Common.
- 2 cars 4/4" 18" up Panel.
- 5 cars 4/4" 13-17" Box Boards.

PLAIN RED OAK
- 2 cars 4/4" 1s and 2s.
- 2 cars 6/4" No. 1 Common and Better.
- 2 cars 10/4" No. 1 Common and Better.

PLAIN WHITE OAK
- 4 cars 4/4" No. 1 Common Plain.

COTTONWOOD
- 2 cars 4/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 5 cars 4/4" No. 2 Common.

ELM
- 2 cars 4/4" Log Run.
- 10 cars 10/4" Log Run.
- 10 cars 12/4" Log Run.

MAPLE
- 4 cars 12/4" Log Run.

We are pleased to offer the following thoroughly dry, band sawn stock for prompt shipment. Highly attractive delivered prices cheerfully quoted upon request. Phone, wire or write for quotations.

QUARTERED WHITE OAK

35M	5/4	FAS
6M	6/4	FAS
185M	4/4	No. 1 Com.
100M	5/4	No. 1 Com.
250M	6/4	No. 1 Com.
70M	8/4	No. 1 Com.
15M	4/4	No. 2 Com.
20M	5/4	No. 2 Com.
15M	6/4	No. 2 Com.
2M	5/4	No. 3 Com.
10M	6/4	No. 3 Com.

QTD. WHITE OAK STRIPS

90M	4/4	C&B 1½—4½
2M	5/4	C&B 1½—4½
3M	6/4	C&B 1½—4½

PLAIN WHITE OAK

25M	4/4	FAS
80M	6/4	No. 1 Com.

QUARTERED RED OAK

1M	3/4	FAS
2M	4/4	FAS
40M	5/4	FAS
35M	4/4	No. 1 Com.
100M	5/4	No. 1 Com.

PLAIN RED OAK

150M	4/4	No. 1 Com.
200M	5/4	No. 1 Com.
100M	6/4	No. 1 Com.
15M	4/4	No. 2 Com.
20M	5/4	No. 2 Com.
20M	6/4	No. 2 Com.
2M	8/4	No. 2 Com.
200M	4/4	No. 3 Com.
40M	5/4	No. 3 Com.
45M	6/4	No. 3 Com.

QUARTERED SYCAMORE

20M	4/4	No. 2 C&B

SOUND WORMY OAK

250M	4/4	
75M	5/4	

QUARTERED RED GUM

3M	4/4	FAS
5M	6/4	FAS
15M	8/4	C&B
10M	4/4	No. 1 Com.
9M	6/4	No. 1 Com.
50M	8/4	No. 1 Com.

PLAIN RED GUM

13M	5/4	No. 1 Com.
2M	6/4	No. 1 Com.
60M	4/4	No. 2 Com.

QUARTERED RED GUM
(Sap No Defect)

100M	8/4	C&B
100M	10/4	C&B
250M	12/4	C&B
9M	6/4	No. 2 Com.
12M	8/4	No. 2 Com.
5M	10/4	No. 2 Com.
5M	12/4	No. 2 Com.

PLAIN SAP GUM

3M	6/4	FAS
60M	6/4	No. 1 Com.
75M	4/4	No. 2 Com.
100M	6/4	No. 2 Com.
25M	4/4	No. 3 Com.
5M	5/4	No. 3 Com.
6M	6/4	No. 3 Com.
100M	8/4	No. 3 Com.

BRIDGE PLANK

75M	3"	

ASH

15M	8/4	C&B
5M	5/4	FAS
100M	5/4	No. 1 Com.
35M	6/4	No. 1 Com.
20M	5/4	No. 2 Com.
4M	6/4	No. 2 Com.
15M	5/4	No. 3 Com.

HICKORY

1M	6/4	C&B
25M	8/4	C&B

COTTONWOOD

15M	4/4	FAS

CYPRESS

4M	4/4	Shop
2M	6/4	Shop
15M	6/4	No. 1 Com.
2M	6/4	No. 2 Com.

ELM

8M	4/4	No. 2 C&B
75M	8/4	No. 2 C&B
40M	12/4	No. 2 C&B
15M	16/4	No. 2 C&B
30M	10/4	No. 1 Com.

TUPELO GUM

30M	wd bx bds	
5M	5/4	C&B
14M	6/4	C&B
30M	4/4	No. 2 Com.

POPLAR

2M	4/4	saps & sel.
40M	4/4	No. 2 Com. C&B

MAPLE

15M	4/4	No. 2 C&B
35M	10/4	No. 2 C&B

LOCUST

3M	4/4	No. 2 C&B

HACKBERRY

7M	4/4	No. 2 C&B

DIRECT FROM PRODUCER TO CONSUMER
WIRE FOR DELIVERED PRICES AT OUR EXPENSE.

GAYOSO LUMBER COMPANY

MEMPHIS, TENNESSEE U.S.A.

Canadian Representative:

W. R. YOUMANS, 972 College Street., Toronto, Ont.

Telephone, Parkdale 6751-W.

WHEELER - TIMLIN LUMBER CO.

WAUSAU, Wisconsin.

You cannot beat the Birch for an all round wood for the furniture manufacturer. We have BEAUTIFUL BIRCH in all standard thicknesses from 4/4″ to 10/4″ and all grades. Write us for delivered prices.

Mills at DORCHESTER, Wis., and WITTENBERG, Wis.

F. T .DOOLEY, President. T. E. JONES, Secy.-Treas.

F. T. Dooley Lumber Co.
Inc.

MANUFACTURERS and WHOLESALERS of

SOUTHERN HARDWOODS

Plain and Quartered Oak
Cypress, Gum, Ash
Soft Maple and Elm

Send us your inquiries

Memphis ∴ ∴ Tennessee

Chas. F. Luehrmann Hardwood Lumber Co.

Manufacturers and Wholesalers of

Hardwood and Yellow Pine Lumber

Office and Yard: 148 Carroll St. St. Louis, Mo.

Hardwood and Yellow Pine for Immediate Shipment from Stock

Complete Stock of Built Up Panels
3 and 5 Ply—Carried in Stock at St. Louis

FIR DRAWER BOTTOMS
FIR DOOR PANELS

Write us for our Stock and Price List

Aromatic Tennessee Red Cedar

CAR LOAD LOTS OR LESS

Earthman Lumber Co.
Murfreesboro, Tenn.

Quality plus Service
AT RIGHT PRICES

Let us quote you on concave chair seat, turned office, piano, restaurant and bath-room stool tops.

Solid table tops, cabinet work; in fact woodwork of all description.

Algoma Wood Products Co.
ALGOMA, WIS.

Band Sawn Poplar, Plain and Quartered White and Red Oak— Quartered Red Gum, Sap No Defect

Below we offer, subject to prior sale and immediate acceptance, the following stock:—

ASH

4/4"	Log Run	20,000 ft.
5/4"	Log Run	4,000 "
6/4"	Log Run	2,000 "
8/4"	Log Run	5,000 "

BASSWOOD

4/4"	No. 2 Com. & Btr.	35,000 "

BEECH

4/4"	Log Run	10,000 "
8/4"	Log Run	40,000 "
10/4"	Log Run	10,000 "
12/4"	Log Run	3,000 "

COTTONWOOD

4/4"	Log Run	10,000 "

QTRD. GUM, SND

4/4"	No. 2 Com. & Btr.	7,500 "
6/4"	FAS	20,000 "
6/4"	No. 1 Com.	40,000 "
8/4"	No. 1 Com.	30,000 "

PLAIN SAP GUM

4/4"	No. 1 Com.	45,000 "
4/4"	No. 2 Com.	30,000 "
5/4"	No. 1 Com. & Btr.	30,000 "

QTRD. BLACK GUM

4/4"	No. 2 Com. & Btr.	45,000 "

PLAIN BLACK GUM

4/4"	No. 1 Com. & Btr.	15,000 "

HICKORY

6/4"	Log Run	2,000 "
8/4"	Log Run	12,000 "

QTRD. WHITE OAK

4/4"	FAS	15,000 ft.
4/4"	No. 1 Com.	84,000 "
4/4"	No. 2 Com.	74,000 "
5/4"	Com. & Btr.	10,000 "

MAGNOLIA

4/4"	FAS	4,000 "
4/4"	No. 1 Com.	50,000 "
4/4"	No. 2 Com.	45,000 "

QTRD. WHITE OAK STRIPS

4/4"	Clr 2½ to 5"	13,000' "
4/4"	Com. 2 to 3"	3,500 "

PLAIN WHITE OAK

4/4"	No. 1 Com.	15,000 "
4/4"	No. 2 Com.	49,000 "

QTRD. RED OAK

4/4"	No. 1 Com.	60,000 "
4/4"	No. 2 Com.	12,000 "

PLAIN RED OAK

4/4"	FAS	48,000 "
4/4"	No. 1 Com	70,000 "
4/4"	No. 2 Com.	74,000 "
5/4"	FAS	30,000 "
5/4"	No. 1 Com.	20,000 "

PLAIN OAK

4/4"	Sound Wormy	78,000 "
4/4"	No. 3 Com.	83,000 "

POPLAR

4/4"	No. 1 Com.	200,000 "
4/4"	No. 2A & B Com.	220,000 "
6/4"	No. 1 Com. & Btr.	33,000 "

SYCAMORE

6/4"	Log Run	21,000 "

We own our stumpage and operate our own band mill in Bude, Miss., manufacturing ten million feet annually, on which we specialize in Quartered White Oak, manufactured from genuine forked leaf White Oak and Yellow Poplar of fine soft texture grown in the hills of Southern Mississippi.

Our grades are dependable and the manufacture of our stock is unsurpassed. We respectfully solicit your enquiries, which will receive our prompt and courteous attention.

L. D. Murrelle Lumber Company

General Sales Office: 1524 Exchange Bldg., Memphis, Tennessee

Band Mill: Bude, Miss.

Reese Sheriff Lumber Co.

WILLIAMSPORT, PENNSYLVANIA

Manufacturers of

Northern and Southern Hardwoods White Pine, Spruce and Hemlock

With special attention to **Oak, Chestnut, Poplar, Cherry, Walnut, Gum and Basswood.**

OUR MOTTO

REASONABLE PRICES – that you can afford to pay.
EFFICIENT SERVICE — that you have a right to expect
FAIR TREATMENT — that you can depend on getting

We would appreciate an opportunity of furnishing a portion of your lumber requirements.

Is it economical ?

Is it the right type ?

Is it the right size ?

THREE GUESSES

Electric power, heating, lighting and equipment problems are to be found in the woodworking industry.

Perhaps your output can be increased? You are, perhaps, losing electrical energy by wasteful types of motors? Are your switches and wiring devices up-to-date or are you in continual danger of fire?

We shall be pleased to answer any questions or help you with any problems whenever you care to write us.

Twice Monthly **Electrical News** $2.00 per year

347 Adelaide St. West., TORONTO

Please send the "Electrical News" to the undersigned until further notice, for which find enclosed Two Dollars, being One Year's Subscription in advance.

Name .....

Address .....

30 Million Feet Hardwoods Yearly

Manufactured by

Darnell-Love Lumber Co.

Leland, Mississippi

We own and operate two large band mills with sufficient timber to supply these mills, at present capacity, fifteen to twenty years

Cutting

Oak, Ash, Gum, Elm

Cypress, Cottonwood

and various other Native Woods

Our Specialties are—

3/8", 1/2", 5/8" and 3/4" in Gum and Oak

and

8/4" Quartered Red Gum

8/4" Quartered Red Gum Sap No Defect

WE SOLICIT YOUR INQUIRIES AND ORDERS

E. SONDHEIMER CO.

MEMPHIS, TENN., U.S.A.

Band Mills at
Baton Rouge, La., Sondheimer, La., Tallulah, La.
Office & Distributing Yard, Memphis, Tenn.

Manufacturers of Southern Hardwoods **Dry Stock Ready for Shipment**

Ask us for prices. We may be able to save you some money. We specialize in genuine Tensas Basin Red Gum—best in the world.

WHITE ASH
1 car each 1", 1¼", 1½" 1s&2s
2 " 2" 1s & 2s
7 " 1" No. 1 Com. & Sel.
3 " 1¼" No. 1 Com. & Sel.
1 " 1½" No. 1 Com. & Sel.
8 " 2" No. 1 Com. & Sel.
1 " each 2½" & 3" ditto
5 " 1" No. 2 Common
2 " 2" No. 2 Common
1 " 2½, 3½, 4" No. 2 Cm.

COTTONWOOD
5 " 1" 1s&2s
1 " 1½" 1s&2s
10 " 1" No. 1 Common
5 " 1¼" No. 1 Common
5 " 1½" No. 1 Common
3 " 1" No. 2 Common
4 " 1¼" No. 2 Common
10 " 1½" No. 2 Common
2 " 1x 9 to 12" Box Bds.
2 " 1x13 to 17" Box Bds.

CYPRESS
1 " 1" Shop
2 " 1" No. 1 Common
1 " each 1x 4, 1x 8", No. 1 Com.
1 " each 1x10, 1x12", No. 1 Com.
1 " 1" Pecky

SOFT ELM
2 " 1½" Log Run
5 " 2" Log Run

PLAIN SAP GUM
10 " each 1" & 1¼" 1s&2s
15 " 4/4" No. 1 Common
2 " 5/4" No. 1 Common
15 " 4/4" No. 2 Common
10 " 5/4" No. 2 Common
5 " 4/4" No. 3 Common

BLACK GUM
1 " 1" Log Run

PECAN
3 " 6/4" Log Run
4 " 8/4" Log Run

MAGNOLIA
2 " 1" No. 2 Common
1 " 1" No. 2 Common

QRTD. RED GUM
5 " 1" 1s&2s
3 " 1¼" 1s&2s
2 " 2" 1s&2s
1 " each 2½ & 3" 1s&2s
8 " 1" No. 1 Common
3 " each 1¼ & 2" No. 1 C.

QRTD. RED GUM
(Sap No Defect)
10 " 1" 1s&2s
1 " 1½" 1s&2s
3 " 2" 1s&2s
5 " 1" No. 1 Common
3 " each 1¼ & 2 "No. 1 C.

QRTD. WHITE OAK
3 " 1" No. 1 Common
1 " 1" No. 2 Common

QRTD. RED OAK
3 " 1" 1s&2s
5 " 1" No. 1 Common
2 " 1" No. 2 Common

PLAIN WHITE OAK
1 " 3/4" 1s&2s
1 " 3/4" No. 1 Common
6 " 4/4" No. 1 Common
5 " 4/4" No. 2 Common

PLAIN RED OAK
2 " each 1" & 1¼" 1s&2s
15 " 1" No. 1 Com. & Sel.
1 " 1¼" No. 1 Com. & Sel.
10 " 1" No. 2 Common
1 " 1¼" No. 2 Common
5 " 1" Sound Wormy
8 " 1" No. 3 Common

QRTD. TUPELO
1" 1s&2s

PLAIN-SAWN TUPELO
6 " 1" 1s&2s
10 " 1" No. 1 Common
5 " 1" No. 2 Common
1 " 1" No. 3 Common
1 " 1x13 to 17" Box Bds.

WILLOW
8 " 1" 1s&2s
5 " 1¼"1s&2s
1 " each 1½ & 2" 1s&2s
15 " 1" No. 1 Common
8 " 1¼" No. 1 Common
1 " 1½" No. 1 Common
10 " 1" No. 2 Common
8 " 1¼" No. 2 Common
10 " 1½" No. 2 Common
5 " 2" No. 2 Common
1 " 1x13 to 17" Box Bds.

Lumber
Walnut, Mahogany Plain and Quartered Oak, Ash, Cherry

Veneers
Walnut and Mahogany

WE specialize in AMERICAN BLACK WALNUT and can furnish straight cars from 3/8 to 4 inches in thickness. Also can load mixed cars WALNUT and MAHOGANY LUMBER and VENEERS, PLAIN and QUARTERED RED and WHITE OAK, ASH and CHERRY.

The Kosse, Shoe and Schleyer Co.

Eastern Branch:
BALTIMORE, Md.

Main Office and Band Mill:
CINCINNATI, Ohio

American Walnut Lumber

QUALITY

SERVICE

More evidence of our untiring efforts to procure the very best raw material for our product.

All Grades and Thicknesses

Pickrel Walnut Company

St. Louis, Missouri

Tustin Hardwood Lumber Co.

MEMPHIS **TENN.**

KILN DRIED AND AIR DRIED SOUTHERN HARDWOODS

We operate five mills and Memphis yard, specializing in KILN DRIED Sap Gum, Elm, Maple, Ash. ***Send us your inquiries.***

Will quote low prices on following to points not embargoed

4 cars 4/4 No. 1 C. & B. Qtd. White Oak.
1 " 4/4 Fas Qtd. Red Oak.
1 " 4/4 No. 1 Com. Qtd. Red Oak.
2 " 4/4 Fas Plain Red Oak.
5 cars 4/4 No. 1 Com. Plain Red Oak.
3 " 8/4 No. 1 C. & B. Qtd. Red Gum.
4 " 8/4 No. 1 C. & B. Qtd. Sap Gum.

Johnson Brothers Hardwood Co.

(OUR NAME IS EASY TO REMEMBER)

Bank of Commerce & Trust Building **MEMPHIS TENN., U.S.A.**

Lumber is selling today at less than the cost of production and any sane person knows that this condition cannot endure long. Prices must rise above their present level very shortly. It is the opinion generally that consumption now exceeds production and will likely continue to do so in even greater proportion for many months to come, even with the curtailed operation of the lumber consuming plants.

It would therefore seem a WISE policy to buy now against your future needs. Someone is going to pay more than present prices for their lumber, before long.

We are prepared to furnish all grades in all thicknesses 4/4" to 8/4", Cottonwood, Sap Gum, Red Gum, Red and White Oak, Ash, Tupelo, Soft Maple, Soft Elm, Sycamore and Willow.

Manufacturers and Wholesalers

SOUTHERN HARDWOODS

CHAPMAN and DEWEY LUMBER CO.

Manufacturers

Band Sawn — Carefully Graded

FURNITURE STOCK

10 Cars 5/4" FAS and No. 1 Com. Sap Gum
5 Cars 4/4" No. 1 Com. and Selects Sap Gum
3 Cars 4/4" No. 1 Com. and Selects Red Gum
5 Cars 4/4" No. 1 Com. and Selects Pl. Red Oak
2 Cars 4/4" No. 1 Com. and Selects Pl. White Oak

Also fully assorted stock in Ash, Soft Maple, Elm, Cypress, Cottonwood. We can save you freight by shipping stock, surfaced and resawn. We will gladly quote you delivered prices, payable Canadian funds.

Chapman and Dewey Lumber Co.
KANSAS CITY, Mo. MARKED TREE, Ark.

BOLAND LUMBER CO.

Murray Bldg., Grand Rapids, Mich.

Manufacturers and Wholesalers
Northern and Southern Hardwoods

Northern Woods:	Southern Woods:
Ash, Basswood, Beech,	Cherry, Chestnut,
Birch, Hard Maple,	Cottonwood, Cypress, Gum,
Quartered Maple,	Hickory, Magnolia,
White Maple, Soft Maple,	Oak, Poplar, Sycamore,
Soft Elm, Rock Elm,	Walnut, Willow.

Yards at Grand Rapids, Mich., on Grand Trunk and Michigan Central R.R.

Please send us your enquiries and it will be a pleasure to quote you and describe our stocks.

OAK

Plain and Quartered
Uniform Color—Soft Texture

Poplar, Ash

and other

Hardwoods

We have 35,000,000 feet dry stock—all of our own manufacture, from our own timber grown in Eastern Kentucky

Prompt Shipments

The Mowbray & Robinson Co.
(INCORPORATED)
Manufacturers
Office: CINCINNATI, OHIO

MILLS
Quicksand, Ky.; Viper, Ky.; West Irvine, Ky.

Canadian Representative:
M. E. CUMMINGS, 814 Richmond Ave., Buffalo, N. Y.

West Virginia Oak

Thoroughly Dry, Accurately Sawn, Soft Textured, and Uniform in Color.

Write us when needing choice stocks. All lumber produced from virgin timber of large size and excellent quality.

Twenty Million Feet Hardwood Ready for Immediate Shipment

OAK

Yellow Poplar, Ash, Hickory, Beech, Chestnut, Basswood, Walnut, Maple

THE THOMAS HALL LUMBER COMPANY

Manufacturers

CHARLESTON, - WEST VIRGINIA

M. BROWN, Canadian Repres. **Address: 87 Neville Park Blvd., Balmy Beach, Toronto**

Tallahatchie Lumber Company

MEMPHIS, TENN.

Manufacturers of

Band Sawn Hardwoods

Graded so as to be especially attractive to Furniture Manufacturers.

Careful attention to every detail of service.

SEND US YOUR INQUIRIES

Chas. Gill Lumber Co.

WAUSAU, WISCONSIN

MANUFACTURERS & WHOLESALERS

SPECIALIZING IN

MAPLE BIRCH AND BASSWOOD

Complete Stock Crating Material

We solicit correspondence relative to all Northern Hardwoods

Chicago Office — 501 Lumber Exchange

Band Sawn West Virginia HARDWOODS

The W. C. Barlett Lumber Co.

Charleston, W. Va.

Manufacturers

ASH to WALNUT

We produce a complete line of Band Sawn Hardwoods, serving the Body and Wheel, Furniture, Piano, Cabinet and Interior Finish Trades.

If Superior Quality, Fine Width and Length, coupled with Real Service is desired, let us have your enquiries.

Hardwood Lumber

Wire collect, or write for delivered prices on any or all of the following DRY STOCK

100,000′ 4/4 No. 1 Com. & Btr. Sap Gum
92,000′ 8/4 No. 2 Com. & Btr. Sap Gum.
69,000′ 4/4 No. 1 Com. & Btr. Plain Red Gum.
36,000′ 8/4 No. 1 Com. & Btr. Qtd. Red Gum.
12,000′ 3/4 No. 2 Com. & Btr. Plain Oak.
119,000′ 4/4 No. 1 Com. & Btr. Plain Oak.
60,000′ 4/4 No. 2 Com. Plain Oak.
68,000′ 5/4 No. 1 Com. & Btr. Plain Oak.
29,000′ 5/4 No. 2 Com. Plain Oak.
16,000′ 8/4 No. 1 Com. & Btr. Plain Oak.
160,000′ 4, 6, 8, 10 and 12/4 No. 2 Com. & Btr. Soft Elm and Soft Maple.
90,000′ 4 and 8/4 No. 2 A&B Com. Poplar.
75,000′ 8, 10 and 12/4 No. 1 Com. & Btr. Poplar.
75,000′ 4/4 No. 2 Com. & Btr. Basswood.
120,000′ 4, 8 and 10/4 No. 2 Com. & Btr. Sycamore
150,000′ 4, 5, 6 and 8/4 No. 2 Com. & Btr. Beech.
200,000′ 4, 5, 6 and 8/4 Sound Wormy Chestnut.

The Woodruff-Powell Lumber Co.

South Bend, Indiana

D. E. Hewit Lumber Co.

Huntington, W. Va.

MANUFACTURERS

West Virginia Hardwoods

(Not Better than the Best but as Good as the Best)

FAS Plain White and Red Oak
No. 1 Com. Plain White and Red Oak
Implement Oak
Sound Wormy Chestnut
No. 1 Common and Better Chestnut
Hickory Plank
Poplar and Basswood

Thompson-Katz Lumber Co.

Manufacturers of

WHITE ASH EXCLUSIVELY

In dealing with us the wood worker and furniture manufacturer may rightly expect a better service, better value and a greater selection from which to choose his requirements. We have all grades and all thicknesses to offer—beautiful stock that we know will please you. Drop us a card to-day—we'll do the rest.

MEMPHIS, TENNESSEE

J. H. Bonner & Sons

Memphis, Tenn.

Mills:

Jonquil and Ruffwood, Ark.

Manufacturers

Band Sawn Hardwood Lumber

Write or wire for prices on

Gum, Oak, Elm, Etc.

Frank Purcell Walnut Lumber Co.

Plenty of logs like the portion of our stock shown above have made possible the million and a half foot stock of well manufactured American Walnut Lumber which we now have to offer.

Prompt shipment

All grades and thicknesses

Guaranteed Inspection

12th AND BELT LINE

Kansas City - Kansas

There is a World of Meaning in this Trade Mark

Three generations have built a reputation for GORHAM quality throughout the furniture and woodworking industry.

When we place our trademark on the back of our product it is for your protection as a guarantee that they are the best that can be produced.

Write us—we havean interesting proposition to make you.

Burns & Knapp Lumber Co.

Manufacturers of

Southern Hardwoods

Plain White and Red Oak, Dimension Oak, Hickory, Ash, Chestnut, Poplar, Basswood, Walnut, Maple, Beech, Butternut.

CONNEAUTVILLE,——————PA.

We list below, items of our own manufacture, band sawn, that we are in a position to ship promptly.

1/2", 5/8, 3/4, 4/4, 5/4, 6/4 & 8/4 Quartered White Oak

3/4, 4/4, 5/4 & 6/4 Qtd. Red Oak

5/8, 3/4, 4/4, 5/4, 6/4 & 8/4 Plain Oak

4/4, 5/4, 6/4, & 8/4 Sound Wormy Oak

5/8, 4/4, 5/4 & 6/4 Plain Sap Gum

4, 5, 6, 8, 10 & 12/4 Qtd. Sap Gum

4, 5 & 6/4 Plain Red Gum.

4, 5, 6, 8, 10 & 12/4 Qtd. Red Gum

4, 5, 6 & 8/4 Tupelo Gum.

5/8, 4, 5, 10 & 12/4 Ash.

5/8, 4, 5, 6, 8, 10 & 12/4 Elm.

5/8, 10 & 12/4 Maple.

4, 5 & 6/4 Cottonwood.

MAY BROTHERS Office and Band Mills: MEMPHIS, TENNESSEE

High Grade White Hickory

Why Pay High Freights on Waste Material? Stock sawed free and clear of defects to specified sizes. Waste eliminated at source. Operating numerous Mills throughout the choicest HARDWOOD BELTS in the United States.

"Buttcutt" Brand

Hickory, Oak and Ash

DIMENSION STOCK

Ski Billets, Picking Sticks, Hockey Sticks, Coupling Rods, Handle Blanks, Furniture Stock, Dowel Blanks, Rim Strips, Spoke Blanks, Shaft and Pole Stock, Gear Woods, Vehicles and Motor Woods for Bending Purposes.

Brown Brothers Company
MANUFACTURERS
11 Broadway - New York

The BRAND of QUALITY

Bigelow HARDWOOD PRODUCTS

The SYMBOL of SERVICE

A Complete Stock of Assorted Grades and Thicknesses

NORTHERN HARDWOODS

ASH, BEECH, BIRCH, BASSWOOD
SOFT ELM, ROCK ELM, HARD MAPLE

THE BIGELOW-COOPER CO.
BAY CITY - - MICHIGAN

St. Francis Basin Hardwoods

Kraetzer Cured and Air Dried

Tennessee Aromatic Red Cedar

Carloads and less or mixed with Hardwoods

"What Others Say"

"Your letter of February 15th received and we want to say that this was a very nice lot of lumber. It was good widths and lengths and well manufactured, dry stock and the grading was very liberal. We are sorry we cannot use more of this lumber at the present time. ***We received several cars from other manufacturers at a cheaper price but the lumber was not nearly as satisfactory.*** When we are in need of more stock we will take the matter up with you."

(Note—The above was sent us February 24, 1921 unsolicited. Name given on application).

GEO. C. BROWN & COMPANY

Home Office - MEMPHIS, TENN.

BAND MILLS, PROCTOR, ARK. CROOKED BAYOU, ARK.

The Arrow Lumber Co.

Manufacturers and Wholesalers of
West Virginia
Hardwoods and White Pine

Oak Timbers Our Specialy

PARKERSBURG, W. VA.
Mills: Raleigh, W. Va. Natural Well, Va.

McLEAN MAHOGANY & CEDAR CO., INC.

American Hardwoods

WE SOLICIT YOUR ENQUIRIES

742 Ellicott Square, Buffalo, N.Y.

Yellow Poplar Lumber Co.

Manufacturers of Band Sawed

Poplar Plain Oak
Quartered Oak
Chestnut Basswood

Capacity 50,000,000 per annum
SPECIALTY: Monogram Brand Oak Flooring

CANADIAN ENQUIRIES SOLICITED

COAL GROVE, OHIO, U. S. A.

The Bacon Lumber Co.

HARDWOODS:
OHIO and INDIANA
KENTUCKY and WEST VIRGINIA
NORTHERN BIRCH and MAPLE
SOUTHERN GUM, COTTONWOOD

306 Ulmer Bldg., Cleveland, Ohio

FIBRO PRODUCTS
REEDS ∴ RATTANS
TURPENTINE
RESIN ∴ WASTE
∴ LINTERS ∴

∴ *PROMPT OR FUTURE SHIPMENTS* ∴

E. T. CARTER & CO., LIMITED
84 FRONT ST., E.——————TORONTO

For Discriminating Buyers

Dry stock ready for prompt shipment

FIGURED RED GUM

3	cars	4/4″	No. 1 Com. & Btr.
2	"	5/4″	No. 1 Common & Better
1	"	8/4″	No. 1 Common & Better

SAP GUM

2	"	4/4″	FAS
2	"	4/4″	FAS, 13″ & up
3	"	4/4″	Box Boards, 13-17″
1	"	5/4″	FAS
1	"	8/4″	Com. & Btr.
3	"	4/4″	No. 1 Common
4	"	5/4″	No. 1 Common
8	"	4/4″	No. 2 Common
10	"	5/4″	No. 2 Common
1	"	6/4″	No. 2 Common
1	"	8/4″	No. 2 Common

PLAIN RED GUM

1	"	4/4″	FAS
3	"	5/4″	FAS
6	"	4/4″	No. 1 Com. & Btr.
3	"	4/4″	No. 1 Common
5	"	5/4″	No. 1 Common
1	"	8/4″	No. 1 Common
3	"	4/4″	No. 2 Common

QUARTERED RED GUM

3	"	4/4″	Com. & Btr.
2	"	5/4″	FAS
5	"	4/4″	Com. & Btr.
4	"	6/4″	Com & Btr.
3	"	8/4″	Com. & Btr.
3	"	5/4″	No. 1 Common

SOFT ELM

1	"	4/4″	Log Run
1	"	5/4″	Log Run
2	"	6/4″	Log Run
1	"	8/4″	Log Run
2	"	10/4″	Log Run
2	"	12/4″	Log Run

QUARTERED RED GUM S.N.D.

1	"	5/4″	FAS
1	"	3/4″	Com. & Btr.
3	"	4/4″	Com. & Btr.
10	"	6/4″	Com. & Btr.
7	"	8/4″	Com. & Btr.
2	"	5/4″	No. 1 Common
2	"	10/4″	No. 1 Common & Better
2	"	12/4″	No. 1 Common & Better

WILLOW

5	"	4/4″	Log Run

CYPRESS

1	"	4/4″	No. 1 Shop
2	"	4/4″	No. 1 Common
1	"	5/4″	FAS
1	"	5/4″	Select
1	"	5/4″	No. 1 Shop
1	"	8/4″	FAS
1	"	8/4″	Select
1	"	8/4″	No. 1 Shop
1	"	8/4″	No. 1 Common

PLAIN RED OAK

1	"	4/4″	FAS
6	"	4/4″	No. 1 Common
7	"	4/4″	No. 2 & No. 3 Common

QUARTERED RED OAK

1	"	4/4″	FAS
7	"	4/4″	No. 1 Common
6	"	4/4″	No. 2 Common

PLAIN WHITE OAK

1	"	4/4″	FAS
4	"	4/4″	No. 1 Common
2	"	4/4″	No. 2 Common

QUARTERED WHITE OAK

1	"	4/4″	FAS
5	"	4/4″	No. 1 Common
7	"	4/4″	No. 2 Common

WIRE FOR QUOTATIONS AT OUR EXPENSE

The

Frank A. Conkling Company

SOUTHERN HARDWOODS

BAND MILLS:
PERCY, Miss., ISSAQUENA, Miss.

Memphis, Tenn.

Indiana

Quartered Red and White

OAK

1,000,000 feet of dry stock carried at all times

ALSO PLAIN OAK AND ASH

We manufacture all stock carried

Evansville Band Mill Co.

FRANK M. CUTSINGER, Pres.
GEO. H. FOOTE, Vice-Pres. & Treas.
JOSEPH WALTMAN, Secretary

Mills at EVANSVILLE, Indiana

Upham & Walsh Inc.

Throop St. South of 22nd St.

Chicago

Northern and Southern Hardwoods

We make a Specialty of

Oak, Gum, Elm, Maple Birch and Basswood.

We solicit your inquiries regarding lumber of any kind

American Hardwood Lumber Co.

St. Louis, Mo.

Large stock of—

Dry Ash, Quartered Oak Plain Oak and Gum

Shipments from — NASHVILLE, Tenn., NEW ORLEANS, La., and BENTON, Ark.

The Hyde Lumber Co.

Band Mills: LAKE PROVIDENCE LA.

Southern Office: MEMPHIS, TENN.
Bank of Commerce Bldg.

Northern Office: SOUTH BEND, IND.

MANUFACTURERS

Plain Red Gum
Quartered Red Gum
Plain Sap Gum
Quartered Sap Gum
Cottonwood, Cypress
Tupelo, Ash, Elm, Oak

CHARLES O. MAUS
Canadian Representative

WARREN ROSS LUMBER CO.

JAMESTOWN, N. Y.

30,000′	4/4″	1s&2s Tanguile Mahogany	12,000′	8/4″	No. 1 Com. Walnut
35,000′	6/4″	to 16/4 1s&2s Tanguile Mahogany	7,000′	8/4″	No. 2 Com. Walnut
20,000′	4/4″	1s&2s Cherry	15,000′	4/4″	1s&2s pl Red Oak
12,000′	4/4″	No. 1 Com. Cherry	4,000′	5/4″	1s&2s Pl. Red Oak
5,000′	6/4″	1s&2s Cherry	4,000′	6/4″	1s&2s Pl. Red Oak
5,000′	8/4″	1s&2s Cherry	20,000′	8/4″	1s&2s Pl. Red Oak
5,000′	5/4″	No. 1 Com. Cherry	20,000′	4/4″	No. 1 C P Red Oak
2,000′	8/4″	No. 1 Com. Cherry	4,000′	5/4″	No. 1 C P Red Oak
110,000′	1″ to 2″	No. 2 Com. & Btr. Beech	4,000′	6/4″	No. 1 C P Red Oak
1,500′	5/4″	Selects Walnut	10,000′	8/4″	No. 1 C P Red Oak
15,000′	8/4″	1s&2s Walnut	15,000′	4″/4″	1s&2s Poplar SND
			3,000′	5/4″	1s&2s Poplar SND
			3,000′	8/4″	1s&2s Poplar SND

Above stock in our Jamestown yard where we have a large stock of all kinds of dry Hardwoods. Also Northern and Southern Hardwoods and Mahogany direct from mill in unlimited quantities.

"Hartzell's Choice Walnut"

The way Walnut comes to us

COMING AND GOING

One constant stream of American Black Walnut from "Stump to Consumer" flowing through a steady, reliable and satisfactory channel.

"Geo. W. Hartzell"

Logs in the rough coming in Veneers and Lumber of the highest quality going out daily year in and year out covering a period of 35 years.

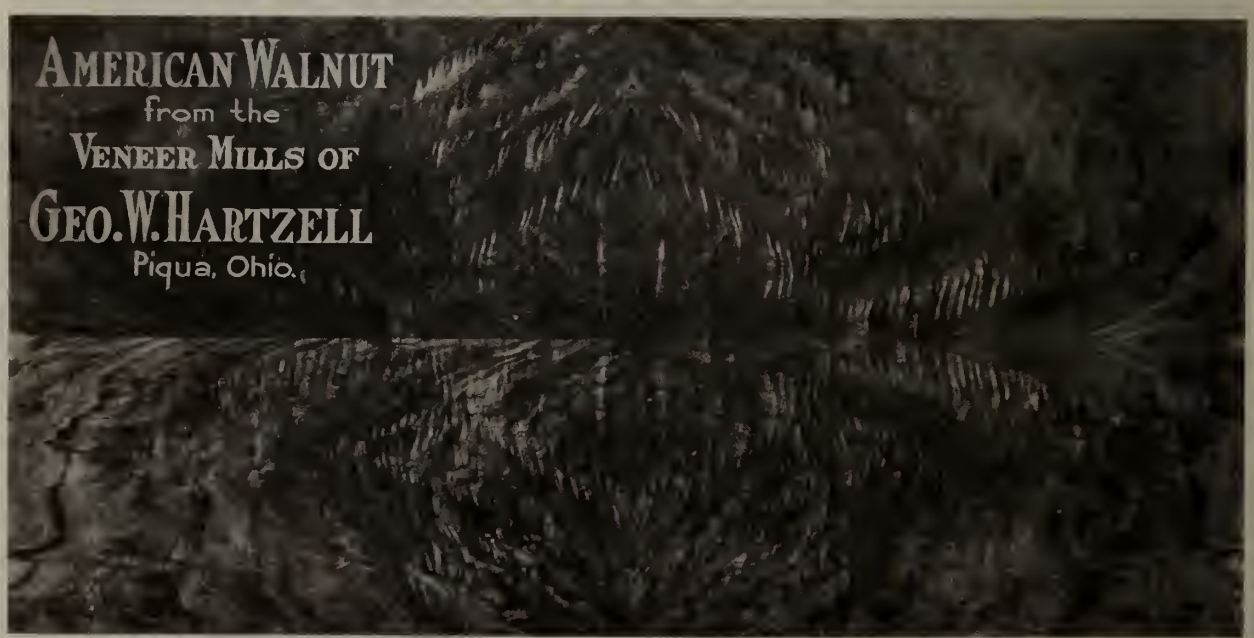
We rightfully claim your patronage because of "SERVICE and QUALITY," if there is any question in your mind about it

"Try Us and We Will Ship You the Convincer"

No Order too large, no Order too small to receive the close and careful attention it is our custom to give. That is a great part of our business, serving our customers.

"WRITE FOR SAMPLES AND QUOTATIONS"

Geo. W. Hartzell - Piqua, Ohio



The way it goes to our Customers

MAHOGANY, WALNUT

LUMBER and VENEER

Poplar Veneer

Quartered Oak Veneer

Loading Mexican Mahogany Logs in the Tropics.

DROP US A LINE WHEN NEXT IN THE MARKET

Lewis Thompson & Co., Inc. - **Colonial Trust Building, Philadelphia, Penn.**

Warerooms: Astoria, L.I., High Point, N.C.

Yards: Astoria, L.I., New Orleans, La.; Philadelphia, Pa.

E. R. Spotswood & Son

INCORPORATED

MANUFACTURERS OF

Kentucky Hardwood Lumber

We specialize in soft texture Kentucky Oak—Plain and Quarter Sawed, also in Ash, Basswood, Chestnut, Poplar, Beech.

Let us quote you on your requirements—our prices are right and we can make prompt shipments direct from our mills.

LEXINGTON - - KENTUCKY

— A name worth remembering —

Thomas E. Powe Lumber Co.

St. Louis, Mo.

Manufacturers and Wholesalers of

SOUTHERN HARDWOODS

Specializing in

Ash-Oak-Gum-Poplar

Mills: PRESCOTT, ARK.—DOTHAN, ALA.

ST. LOUIS YARD

Mixed Carload Shipments — Carry stocks of the following:

Hickory	Magnolia	Elm
Maple	Willow	Sycamore
Tupelo	Red Cedar	Beech
Cypress	Plain Oak	Quartered Oak
Sap Gum	Red Gum	Mahogany
Poplar	Ash	Black Gum
Yellow Pine		

WAYNE LUMBER CO.

Manufacturers and Wholesalers

110 West 40th St. New York

Canadian Hardwoods

BROWN ASH

10,000' 1¼ No. 1 Com. & B.
10,000' 1¼ No. 2 Common

BASSWOOD

200,000' 1¼ Log Run
1 car 1½ Log Run
1 car 2 Log Run

SOFT ELM

50,000' 1" Log Run
40,000' 2 Log Run

BIRCH

15 cars 1" No. 1 Common
15 " 1 No. 2 Common
10 " 1¼ No. 1 Common
7 " 1¼ No. 2 Common
10 " 2 No. 1 Com&1s&2s
7 " 2 No. 2 Common
3 " 2½ No. 1 Com&1s&2s
3 " 2½ No. 2 Common
4 " 3 No. 1 Com&1s&2s

HARD MAPLE

40,000' 1¼" No. 1 Com&1s&2s
10,000 1¼ No. 2 Common

MAPLE AND BIRCH OUR SPECIALTY

BOXING & CRATING
6 cars 1" Soft Elm & Ash
10 " 1" Birch

All Lumber Shipped by Our Own Inspectors

A name that should be on your inquiry list for Hardwood Lumber

American Column & Lumber Co.

Brunson Building, COLUMBUS, OHIO

—Manufacturers of—

West Virginia

Soft Yellow Poplar
Plain White Oak
Plain Red Oak
Quartered White Oak
White Oak Timbers and Plank

Chestnut	Butternut
Basswood	Ash
Maple	Cherry
Hickory	Walnut
Beech	Sycamore
Buckeye	Black Gum
Birch	Hemlock

Oak and Hardwood Dimension Stock

Steele & Hibbard Lumber Co.

ST. LOUIS, MO.

52 Years in Business

We carry a large stock of dry

Hardwood Lumber

25 Different Kinds
Quick Shipment
Write or wire for Prices

We specialize Oak cut from Mild Texture Missouri Timber with thin sap both plain and quarter sawed.

We ship also from Sawmills direct; Red as well as Sap Gum and Poplar, both plain and quarter sawed Sound Wormy Chestnut, Cypress and Ash.

"Wire collect for prices or other information. Time is Money, delays pay no dividend."

PERIOD CARVINGS

for

FURNITURE

Quality the Best

Prompt Shipment

Largest Manufacturers of Imitation Wood Carvings in the World

Unlimited facilities for the manufacturing of high grade period wood carvings in composition and wood fibre. Reproductions of exclusive designs our specialty.

CATALOGUE SENT ON REQUEST

THE DECORATORS SUPPLY COMPANY

ARCHER, LEO AND LIME STREETS

CHICAGO

J. W. Frye Lumber and Veneer Co.

Dayton - Ohio

Manufacturers and Wholesalers

Specialize in

Walnut Lumber and Veneers

Oak Lumber and Veneers

Also All Native Hardwoods

Guarantee all stocks to be Ohio and Indiana grown

THE LONDON LUMBER COMPANY LIMITED

WHOLESALE LUMBER

Will make attractive prices for 4/4 Birch and Elm; immediate shipment. Also have good stock in all thicknesses. Soft and Hard Maple, Ash, and Basswood. Write us for quotations.

487½ RICHMOND STREET
LONDON, ONT.

We have been in business long enough to know the buyers' individual needs, and can give prompt action on your requirements from both

NEW YORK CITY
AND
MEMPHIS, TENN.

Where we are located.

Don't fail to write or wire us, at our expense, when in the market for real high grade, good quality and texture band sawn hardwoods.

Competitive prices, careful attention to all inquiries and orders.

Liverpool Hardwood Co. Inc.

50 Church St., New York City.

Bank of Commerce & Trust Bldg., Memphis.

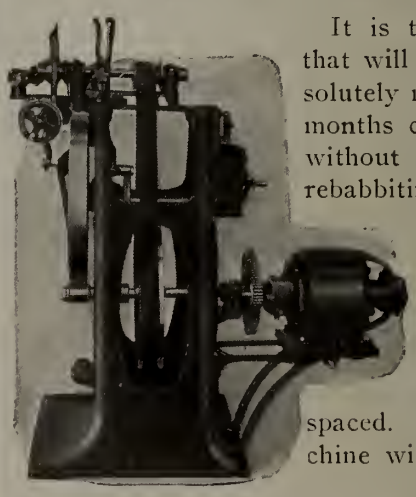
Means **L. H. C.** *Quality*

OUR EXPORT BRAND

The Berry Combination Band and Circular Automatic Saw Sharpener

Belt or Motor Driven. Capacity: Bands, 3-16" to 4", Circulars 4" to 32". Simple, Universal, Automatic in Action.

It is the only *combination* grinder that is *automatic*



It is the only grinder that will grind a saw absolutely round after three months continuous use—without readjustment or rebabbiting. It will take an unevenly spaced, hand-filed saw and make it perfectly round and even spaced. No other machine will do this.

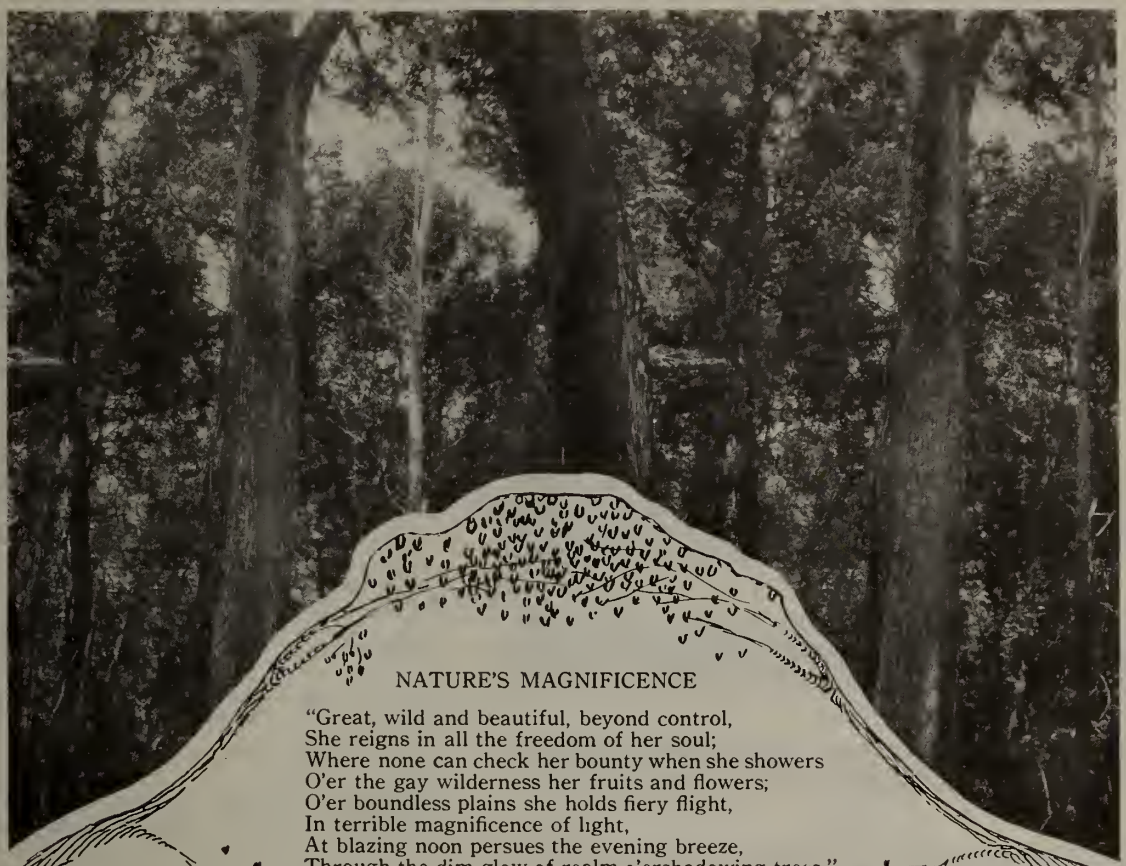
For All Shops Using Circular or Band Saws

The Berry Tooth is far superior to the ordinary peg tooth. All teeth are alike, evenly spaced—ground right from the center. A saw ground with this machine does twice the work in half the time.

Write for Booklet to-day.

O. V. HOOKER & SON

St. Johnsbury Vermont



NATURE'S MAGNIFICENCE

"Great, wild and beautiful, beyond control,
She reigns in all the freedom of her soul;
Where none can check her bounty when she showers
O'er the gay wilderness her fruits and flowers;
O'er boundless plains she holds fiery flight,
In terrible magnificence of light,
At blazing noon persues the evening breeze,
Through the dim glow of realm-o'ershadowing trees."

The African Mahogany Tree grows in the heart of "Nature's Magnificence," six thousand miles away.

The Mengel Company has operated its own mahogany camps for many years; has selected and felled its own trees; has logged its own timber down the wild flood of the Tropical Rivers. ***And these operations are undertaken by no other manufacturer of mahogany veneer in the world.***

THE MENGEL COMPANY

INCORPORATED

LOUISVILLE, KY.

THE PAST AND PRESENT IN MAHOGANY

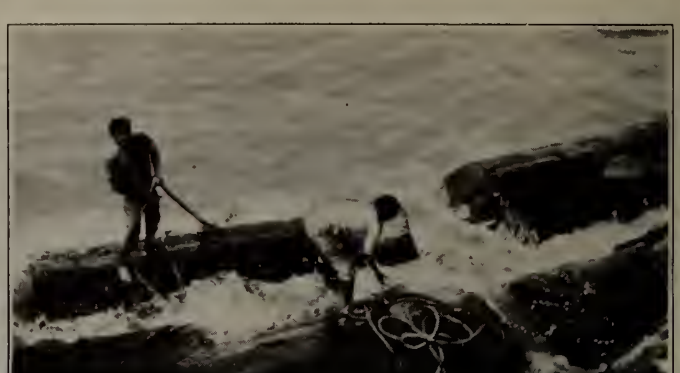
The Talge Mahogany Co.

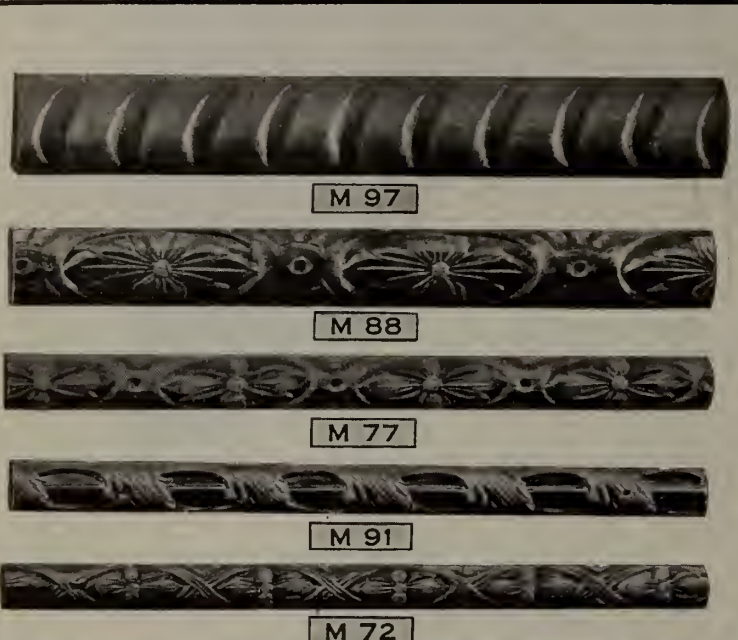
INDIANAPOLIS

Offers you the most exclusive line of **Foreign and Domestic Veeners and Lumber**

We specialize in **Mahogany, Walnut and Oak**

No Order too Small—No Order too Large





MOULDINGS We are making more Period Mouldings than ever before. Orders should be placed early to assure your supply when needed.

KNOBS The Period Knobs we placed on the market a few months ago are proving very popular. If you have not received samples ask for them now.

ROSETTES A new Period item to accompany the knobs.

Waddell Manufacturing Company

Coldbrook and Taylor, N. W. **Grand Rapids, Mich.**

Tennessee Lumber & Coal Company

Manufacturers and Wholesalers

SOUTHERN HARDWOODS

Soft Textured White and Red Oak, Poplar, Chestnut, Southern Gum

OAK TIMBERS AND PLANKING CUT TO ORDER

Band Mills: Verdun, Tenn., Louvain, Tenn. **Submit your enquiries to our Sales office, Cincinnati, Ohio.**

The Wise Buyer ——

QUALITY

SERVICE

The best time to buy, is—now. Prices are down. The next movement will be upward.

We are specialists in our field of activity, which means a high standard of Quality and service.

Manufacturers of

OAK - POPLAR - GUM

Memphis Band Mill Co.

"Quarter-Sawn White Oak Headquarters"

Memphis, Tenn. - U. S. A.

Efficiency Marks Every Step of Our Service to You

Exact photograph of alley in our yard

White and Red Oak

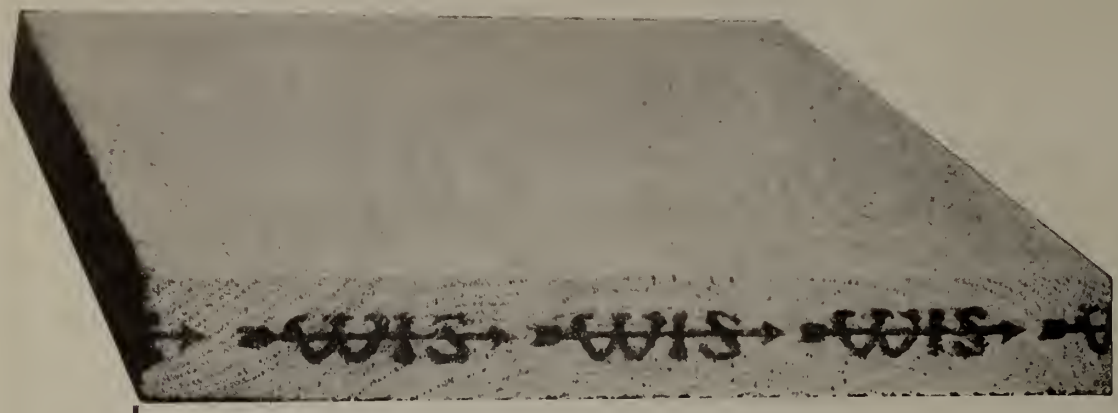
Plain & Quarter Sawed Red Gum

Our Specialty Quarter Sawed Red Gum in Plain and Figured Wood

From the cutting to the delivery to your hands, our entire stock receives the most careful attention. All the excellence of quality and the beauty of the wood is kept just as it is when cut. When next you are in need of Oak, Ash, Elm, and Cypress of first class quality and in perfect condition write us. We can ship promptly.

BARR-HOLADAY LUMBER CO.

BAND MILL AT LOUISE, MISS. GREENFIELD, OHIO



The Trade-Mark Is Your Guarantee of Quality

The service brand "WIS" on Hardwood Lumber means there is no "Pussyfooting" on Grades

In branding our trade-mark, "WIS," on the end of each board during course of production we are staking our good name on furnishing the promised superiority of grade, quality and manufacture. With this trade mark you hold a bond against us for full value of every board you receive. "It is an Insurance Policy of everlasting value and permanent quality; a mark of present and future service."

Guaranteed hardwoods must appeal to you as removing the element of chance, assuring you of the receipt of lumber exactly as represented.

If getting the most for your money interests you, "WIS" brand lumber is the kind you will order.

WISCONSIN LUMBER CO.

CHICAGO **ILLINOIS**

Is back of

WIS

BAND MILLS - DEERING, MO.

"CHICAGO MILL"
DIMENSION STOCK
FROM
SOUTHERN HARDWOOD LUMBER

Our Cairo, Ill., Plant Largest in Operation

Exclusively engaged in the manufacture of
DIMENSION STOCK
(Kiln Dried or Air Dried)

Dimension Lumber Kiln Dried Means:

1. **The elimination of waste.**
2. **A saving of at least 40% in freight.**
3. **Lumber delivered at the woodworker's plant ready for immediate use.**
4. **A quick turnover and minimum investment in lumber.**

The benefits to be derived from the use of Chicago Mill Dimension Lumber are cumulative. In the long run it means lower production cost for the finished article.

For particulars and prices address

Chicago Mill and Lumber Company

FROM
Sycamore
Ash, Elm
Oak, Gum
Cottonwood
Cypress, Maple

Dimension Lumber Department
111 WEST WASHINGTON STREET
CHICAGO, ILLINOIS

FOR
Furniture
Automobiles
Drawer Sides
Kitchen Cabinets
Garment Hangers

(HAVE YOU SECURED OUR QUOTATIONS ON ROTARY COMMERCIAL VENEER?)

SOUTHERN HARDWOODS

Unexcelled Quality and Service

Prompt Shipment — Dry Stock — Uniform Quality and Inspection
Band Sawn and End Trimmed — Full and Uniform Thickness — Good Run of Widths and Lengths

Twenty-five years of service to the most exacting users of quality hardwoods enables Paepcke Leicht to help you get your exact requirements in southern hardwoods no matter what they may be.

This experienced service is impartial,—its purpose is to help you select the wood best suited for your use—uniform in quality and of the most economical grade which will prove entirely satisfactory for the job.

We Specialize in Oak and Gum

PAEPCKE LEICHT LUMBER COMPANY

GENERAL OFFICES—Conway Building
111 West Washington Street, Chicago, Ill.

BAND MILLS—Helena, Ark., Blytheville, Ark.
Greenville, Miss.

ROBT. BURY & CO., Canada

LIMITED

Hardwoods and Veneers

THREE PLY FIR AND COTTONWOOD PANELS

LUMBER

Mahogany
(250,000 ft. in stock, all kinds)
Walnut
Qtd. White Oak
Plain Red Oak
Poplar
Gum
And all U. S. A. Hardwoods
Birch
Basswood
Maple
Beech
Elm
Ash
And all other Canadian Hardwoods

VENEERS

SAWN

Qtd. White Oak
Qtd. Red Oak
Plain Oak
Mahogany (all kinds)
English Oak
Teak Ash Cherry
Vermillion Birch
Poplar

ROTARY CUT

Birch, Poplar, Ash, Gum
Walnut, Basswood, Maple

SLICED

Mahogany, Walnut
Figured Gum

We Specialize in Mixed Shipments of Dry Hardwoods, Veneers and Panels

This is a good time to conserve your capital by making your purchases in this manner

Head Office and Veneer Warehouse
Spadina Avenue, TORONTO

Lumber Yard, Dry Kilns and Mill
Foot Spadina Ave., TORONTO

EASTERN BRANCH—369 ST. JAMES STREET, MONTREAL

CANADIAN
WOODWORKER
and
Furniture Manufacturer

A Monthly Publication of Trade News and Practical Information, reaching the factories producing Interior Finish, Doors, Sash, Flooring, Boxes, Aeroplanes, Furniture, Pianos, etc.

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Getting Back to Normal

One feature that tends for uncertainty and distrust is the discrepancy which exists between the values placed on their products by different manufacturers. There is a wide variation in the quotations and prices asked by various woodworkers. This holds true in the case of small orders as well as where large bills are figured. While there may be some excuse for a difference of a few hundred dollars in the figures asked for the woodwork for a house, something is radically wrong when the variation runs into the thousands or where there is a wide difference when the value of the work is small.

A case to point was brought to the attention of the "Canadian Woodworker" recently. Two of the largest woodworking concerns in Ontario were asked for figures on a small piece of work. One quoted $150.00 and the other named $280.00 as his best price, a difference of nearly 100 per cent. What hope is there of conditions in this industry becoming stabilized as long as there is such a lack of agreement as to values?

It is extremely difficult to explain why experienced estimators, practical men of long experience, who should know their work and know values, cannot agree as to the worth of some simple piece of work. The most likely explanation is that in this particular instance one figured the material on replacement value while the other based his price on the actual cost of the stock required.

This brings up an important point—one that is applicable to all branches of industry. In a time of depression and deflated values, such as that through which we are passing, is it advisable for a manufacturer to accept a loss, due to depreciated values, as quickly as possible and work up and dispose of his stock, basing his costs on replacement value, or is he justified in attempting to maintain prices at a level that will enable him to dispose of all accumulated stores of raw material at a figure which will, at least, return the money invested, when such a course tends to retard the return of normal conditions.

If there ever was a time when there was a chance of realizing on high-priced material, it would appear as if such a period has long since passed. It does not seem probable that material purchased when values were at their peak, can be turned at a figure based on actual cost. What governs the value of any article,—the price paid or general market conditions? The value of high-priced material in the hands of a manufacturer depreciated while in his possession. The loss has already taken place. Sooner or later the time will come when the loss must be accepted.

There is a bright side to the situation. Let us suppose a case. An order is accepted for goods at a price which shows a profit, figuring the material at replacement value. The stock to be used was purchased when prices were at their peak, so that it would appear as if a heavy loss was inevitable. The work is completed, delivered and the money received. Some of this money is used to replace the material which was worked up. The manufacturer now has the same stock as before and in addition is a few dollars ahead on the transaction. It would be futile to attempt to show that a profit was made for undoubtedly a loss has been accepted, but the point is that that manufacturer is in a far better position than if he had held up his price and lost the business.

It has been suggested by some, who have made a study of conditions, that the best way to get back to normal is to accept normal values and carry on as if normal conditions existed. This would entail a loss for the time being, but this loss could be carried in a special adjustment account and liquidated at a later date. The steps suggested for getting back to normal are in brief: Determine normal production, standardize the expense of doing business, determine fair standards of performance by the workers, determine quantity of goods which can be made, estimate cost of normal production, determine fair prices at normal profits, hold losses between standard and actual overhead for the year in a special adjustment account, take workers into your confidence, secure co-operation of bankers and plan a selling and advertising campaign. If everyone were to adopt such a policy—presto, business would be normal.

There has been a slight improvement in general conditions. The volume of business offering is not large, but it is slowly increasing. Let every woodworker do his part and bend every effort to assist rather than hinder the return to normal, healthy trade. There is such a thing as being too conservative, too economical. Let judgment and courage rule rather than fear and lack of confidence. Economy that avoids waste is always commendable and should be worked overtime under present conditions, but economy that throttles production, stifles demand and creates unemployment is unwise.

"Perfection" Objective in St. Therese Plant

Willis & Co., Limited, Demand Quality Rather Than Quantity — Organized for Efficient Operation—Production in Neighborhood of 4000 Pianos Annually

(By F. H. Devenish, of our Montreal Staff)

"PERFECTION" is the aim and motto of Willis & Co., Ltd., piano manufacturers, Montreal and Ste. Therese, Quebec. The plant at Ste. Therese is laid out and equipped with this end always in view, and the workmen are also instructed verbally and by printed notices, in English and French, to make this the only consideration in carrying out the various operations of manufacture. The office administration, too, is based on efficiency, the one object being to turn out instruments of a high grade, combining the best material and construction with a quality of tone which has no superior in Canadian made pianos.

Clamping up the key-boards in the cabinet making department.

The "House of Willis" needs no introduction to Canadians. It is one of the oldest and most respected organization in the piano business in the Dominion. The name is closely associated with the musical history of Canada, the firm having been purveyors to Royalty, the leading educational and religious institutions, and private families generally for over forty years.

Manufacturing Since 1877

This well known organization was founded in 1877, by Alexander Parker Willis, the president of the company. In its inception it was conducted on a very modest scale. About twenty years ago a factory was opened at St. Therese, Que. This was a wooden building and still remains as a part of the present plant. From time to time additions have been made, until today the plant has a capacity of 4,000 pianos per annum. The present factory, which consists of a basement and three storeys, gives a floor space 100,000 feet. Last year a new kiln and a varnish drying room were constructed, and it is proposed to build a kiln for drying veneers.

The plant has a unique situation, in that it is located on the two sides of a small stream, the power plant being on one side and the factory on the other. A concrete dam and sluice enables the flow of water to be regulated. Every precaution against fire is adopted. The factory is sprinkled, buckets filled with sand are placed on each floor, and a tank of 40,000 gallons capacity is erected on a steel frame outside the main building.

Modern Drying Equipment Installed

There is ample yard room for storing the lumber, which is air-dried from two to five years.. Stocks of mahogany, fir, balsam, birch, maple, elm, basswood, spruce, pine and walnut are piled in the yards, while generous supplies of mahogany, walnut ,oak, maple and birch veneers are stored in a large shed.

The new kiln is a very substantial structure of reinforced concrete on steel girders, and brick. It is in two sections, one for the one inch stock and the other for the two inch stock. At the receiving end there is a pit, with reinforced concrete pillars to carry the truck rails. The object of the pit is to collect the humidity in the first stage of drying, the water laden air being drawn off by flues at the bottom of the pit. After being dried, the lumber is cooled off in a cool-

Action setting and regulating. Note treadle on boring machine.

Sound board and bellying department. On right, attaching ribs to sounding boards by means of "go-bars."

ing chamber. There are loading and unloading platforms at the ends of the kiln. Economy is always considered, and the kiln is heated by exhaust steam from the power plant.

In the basement the packing cases are made from tongued and grooved spruce. The boxes are lined with sheathing paper. The glueing of walnut butt veneers is also conducted on this floor, it being necessary to do this work in a comparatively humid atmosphere, as the veneers have a tendency to crack in a hot, dry place.

Favor Aluminum Cauls

The lumber after being dried is taken to the machine department, on the first floor, as required. Here it is cut and ripped to length, and also inspected for defects. It is also planed to gauge for thickness. The machines used for machining the core stock, falls, trusses, toe-blocks, etc., are those of the Canada Machinery Corporation, of Galt, Ont. From the machine shop the stock is conveyed to the adjoining glueing department. Here the cores are built up. These cores are of birch, with cross-bands of birch veneer, and then, as a rule, mahogany face veneer, making a five-ply material. The glueing is done by a Francis spreader, which covers both sides of the veneers simultaneously, and makes an even spread of the glue. Aluminum cauls are placed between each panel. Aluminum is used because it is light, easily handled, retains heat, and presents a smooth, polished surface, upon which the glue does not adhere and which produces veneered work with a smooth, even surface. In the case of curved stock, zinc cauls are employed. The cauls are allowed to gradually cool, as if the panels were subject to chill the glue would lose its strength. The veneered stock is stored for two months in a very spacious section on the same floor, precaution being taken to see that it is properly piled, thus keeping these pieces in perfect condition. These are taken out as required and cut to size.

A corner in the machine room. Floors are scrupulously clean and stock kept in orderly piles.

The cabinet-making room is on the next floor. It is a very large department, the benches being arranged under each window so as to give the maximum amount of light. A certain amount of veneering is done here, the edge veneers being put on the stock. In addition, others parts are prepared, the sanding being done on Lucas and Fisher belt sanders.

The rast or back is one of the most important parts of a piano, in that it has to bear a considerable share in taking the great strain incidental to tuning. After it has been glued the back is cut to dimensions by a machine specially built for Willis & Co., Limited. This is a horizontal table, on which the back is placed, the planing down to dimensions being done by a rotary saw. The wrest plank and pin block and sounding are then fitted. The wrest plank is built up of ¼ inch selected quartered rock maple, cross-banded on a core of rock maple. The sounding board is of spruce, and is built of strips running in a diagonal direction. When glued together in the rough, the board is ½ inch thick, but it is planed and sand papered down to a finished thickness of from a ¼ inch in the bass end to ⅜ inch at the treble end. The bridges and ribs of the sounding board are glued on before it is fitted to the rast.

The bridges are made of thin strips of maple glued together. This is known as laminated construction and gives them great strength. They are bored for the bridge pins prior to being fitted. The sounding board, ribs and bridges are prepared in the bellying department. The sounding board receives a coat of varnish before it is attached to the rast.

The next operation is the fitting on of the plate or iron frame, which has

Gluing stock, showing Francis spreader and heater. Part of hot box showing on extreme right.

been previously bronzed. The pins are then driven in, after which the strings are attached.

Mechanical Equipment in Finishing Room

From the cabinet shop, the parts are sent "in the white" to the top floor, where the finishing department is situated. The stains are made up in a special room, the company believing that they get better results by manufacturing their own stains. The cases receive, in addition to the stain and filler, five or six coats of varnish. The first coats of varnish are applied by DeVilbiss spraying machines, and the final coats are flowed on by hand. The under coats are dried in a kiln, the walls of which are of double thickness. After this process the pieces are seasoned, and then go to the Maddox rubbing machines, finally being hand rubbed. The oak cases are fumed and waxed, the light pieces being given a coat of oil to give them a dark appearance. All the various parts which are varnished and polished are transferred on roller racks, thus eliminating all risk of damage, and facilitating handling.

The final touches are given in the side glueing department, where the pianos are transferred after the strings and keys have been fitted. In this department the instrument is set up, the pedals and the pedals straps put on, the castors fitted, and the action and keyboard adjusted. The piano receives several tunings and chippings, as well as action regulating and special fine tone regulating. It then gets another polishing, and after being fitted with the hardware parts it is again fine tuned and fine regulated by experts and is ready for the market.

Mechanical and Power Installations

The following is a list of the machinery used:—Sticker, two pony planers, swing cut cross saw, three 16" buzz planers, dowell machine, rip and cross cut saw, two band saws, shaper, two boring machines, turning lathe, drum sander, manufactured by McGregor, Gourley Co. Ltd., Galt, Ont.; self feed rip saw, self feed buzz planer, band saw, boring machine and belt sander, manufactured by the Canada Machinery Corporation, Galt, Ont.; rip and cross cut saw, manufactured by the Beach Manufacturing Co., Montrose, Pa., U.S.A.; belt sander, manufactured by the Fisher Sander Co., Kitchener, Ont.; two rubbing machines, manufactured by the Maddox Machine Co., Jamestown, N.Y., U.S.A.; three varnish sprayers, manufactured by the DeVilbiss Mfg. Co., Toledo, Ohio, U.S.A.; and glue heaters and glue spreaders, by the Chas. E. Francis Co., Rushville, Ind., U.S.A.

Rubbing by hand and with Maddox automatic rubbers.

In addition to this the company use veneer presses, clamps and forms for rasts, special cut-off saw for backs, and kilns manufactured by themselves. The glue is supplied by F. Canac Marquis, Quebec City.

The equipment in the power plant consists of two boilers, by Leonard & Sons, London, Ont., and two fire pumps, connected with the tank, a 175 h.p. engine of the Jerome Wheelock type, supplied by Goldie &

Varnish being applied with DeVilbiss equipment. Note varnish drying kiln and movable racks.

McCulloch, Galt, Ont., a compressor for the varnish spraying machine, are situated in the same building. From the power house the steam is conveyed overhead in a covered box across the stream to the factory, and used, in addition to heating the buildings, for various purposes, such as heating the glue, caul boxes, varnishing, etc., etc. All the condensation returns go to the boilers, thus economizing on steam. Grease and steam separators are installed.

Capable and Efficient Management

The factory offices are on the first floor, and are exceptionally spacious and well equipped. The stock room adjoins, this being so arranged that the stockkeeper is alone responsible for receiving and distributing the large amount of stock, such as hardware, fittings, glue, felts, etc., which is required. The head offices are in the Willis Building, an imposing eight-storey structure of Indiana limestone, 580 St. Catherine Street West, Montreal, and are under the management of Inglis Willis, the city sales manager.

The directors of the company are A. P. Willis, president, R. A. Willis, vice-president, C. D. Patterson, general manager, W. D. Willis, secretary, G. L. Duncan, treasurer, F. G. Sharpe, A. S. Benoit and A. Desjardins. The direct management of the factory devolves upon A. P. Willis, Jr., son of the president, who has been associated with the work of the factory for many years, from a practical as well as an official point of view. He makes his home at the factory, and has acquired a thorough knowledge of the men and of the French language. He is assisted by Joseph Colpron, as general superintendent, a man of thirty years practical piano experience.

Furniture vs. Washing Machines and Autos

Is Furniture to Give Way to Vacuum Cleaners and Washing Machines—Sales Methods Must be Revised—Widespread, Co-operative Advertising Offers Solution

By R. W. Wells

In this day of evolution and change, it is evident to the most casual observer of publicity that co-operative advertising by groups of industries is the order of the day. I share the opinion of some leading merchandisers that the next five or ten years will see this method the outstanding development in sales promotion.

A glance through any of the American magazines will reveal a number of co-operative advertising campaigns that are spreading the most effective sales promoting propaganda. This is particularly true of the industries that figure in the building of a house—the makers of hollow tile, face brick, limestone and common brick; otherwise the producers of cement, stucco board and interior woodwork, all set forth the merits of their respective products in a most convincing fashion. Nor do they stop at this. These various groups offer to the public (usually without charge) books of house plans, color schemes and, for a small fee, complete working blueprints and specifications.

Increased Sales the Result

The results of these publicity campaigns now in progress are most encouraging and could well be considered by the furniture manufacturers of Canada, who made such a promising "preliminary canter" last fall on the "track" of modern merchandising.

I have been in correspondence with the officers conducting many of the above-mentioned campaigns and this is a typical statement regarding results: "Our members are held together, there is a better tone in the industry, there is a marked development of progressiveness in our individual manufacturers, and the public is responding magnificently to our advertising suggestions. We are more than pleased and expect to continue our efforts indefinitely."

Furniture Not Considered

Let us consider these campaigns together with the individual campaigns of firms manufacturing linoleums, ready roofing, wall paper, paints and woodwork and the automobile to go with it all. Here we have national advertising, telling of a score of different ways to build and decorate a house. What about the furniture?

Few individual firms or any group of manufacturers are advancing the merits of any kind of furniture or suggesting furniture at all. It is forgotten in the plans for a house. True, a number of cabinet makers are offering to reproduce old masterpieces but no furniture advertising is making an appeal to the great majority of the people. Yet what merchandise is there (outside of the automobile) that has a greater appeal than furniture. Say "Furniture" to almost anybody and they are interested. Talk it to them and they listen.

Not Securing Its Just Share

Right now, the furniture industry of Canada is being robbed of its legitimate share of the public's money by the makers of washing machines, vacuum cleaners, automobiles, pianos, jewellery and a score of other manufacturers, who recognize the vital importance of national advertising and who go after business in an aggressive, not-to-be-denied manner.

Advertising has made the washing machine a necessity. It has made the vacuum cleaner a necessity. It has given jewellery the preference for gifts for all occasions. It is responsible for the rapid growth of the automobile industry. Yet this great and powerful servant, "advertising," lies waiting, in vain, for the Canadian furniture manufacturers to realize its value and permit it to increase their sales.

The furniture industry has a war to fight against competitive products—it must fight with advertising and must fight soon for its prosperity and development.

Fir Stump Roots for Furniture

One inventor at Victoria may solve the question of getting rid of the huge stumps on cut-over forest lands in B. C. He is laying before the department of industries his plans for putting up small portable sawmills to be sent to various places where the stumps are plentiful. The mills will cut them in slabs, bringing out the gnarled grain of the roots. These slabs he says take a fine polish and can be used for various purposes. The price for slabs with the best grain suitable for furniture, etc., runs to $6.00, and the inventor claims some stumps when sawn up will run to $18.00.

Engineering in Furniture Factories

Handling and Transporting Material—Figuring Power Requirement and Type of Prime Mover—Future Expansion of Plant Must be Considered

By B. A. Parks*

One of the most important problems confronting the furniture manufacturer is the receiving, handling, storing, drying, and transporting of the raw material, namely, lumber. Much thought and study should be placed on the arrangement of sidings, storage yards, dry kilns, cut-off saws, etc., as an efficient layout will pay for its development many times over in decreased labor and saving in time.

The lumber storage yard should be large enough to at least hold a year's supply in order that advantage may be taken of favorable market conditions and also to avoid delays in delivery due to transportation difficulties. The ideal storage yard should be equipped throughout with industrial trackage laid parallel with the receiving siding. This trackage system should be served by at least two transfer tracks running at right angles to the receiving siding. With this arrangement lumber is unloaded and sorted directly on small lumber trucks or "bunks" of the ordinary kind and then by means of the transfer tracks the truck loads, containing about 4000 ft., are placed in storage ready to be taken to the kilns for drying.

The type of kiln used will depend on the thickness and kind of stock to be used and also somewhat on the individual preference of the superintendent, but they should be so located in a battery as to be served by the same system of transfer tracks that serve the storage yard. A dry storage shed equipped with industrial trackage is also valuable as it allows for an accumulation of dry material and thus avoids delays in receiving lumber at the cut-off saws which might be occasioned by accidents to the kilns, stock spoiled in process of drying, or other delays between the kilns and the mill.

The same system of transfer tracks that serves the storage yard and kilns should be extended to the cut-off saws, where there should be provided hydraulic or screw lifts or elevators to raise the entire load of lumber and keep the top of the pile a few inches above the tops of the saw tables.

Cuts Down Hauling Costs

It will be seen that with the above arrangement the lumber is not handled from the time it leaves the railroad car until it is placed on the table of the cut-off saw, and the consequent decrease in handling costs is at once apparent. The arrangement of lumber storage yard, kilns and transfer track to cut-off saws is of course a problem for each individual case, and consequently only brief suggestions can be offered here which must be worked out by the engineer to suit each situation.

While receiving and handling of the lumber should probably receive the greatest consideration in laying out the transportation facilities to and from the plant, yet railroad sidings to the power plant, for the delivery of machinery and coal, and to the shipping room for shipping the finished product, should not be overlooked but should receive thoughtful study. It should be borne in mind that sidings to the lumber storage, power plant, and shipping room should have separate access to the main tracks, if possible, so that switching may be done on any siding without its being necessary to disturb the cars on any other.

Provision for Extending the Plant

Probably the most efficient and economical method of extending or enlarging a furniture plant is on the sectional plan, each new extension consisting of a more or less complete unit in itself. This method also creates the least amount of disturbance to the existing arrangment of any plan that might be devised. With this in mind the original plant, as described above, should have a service wing at one side in the center in which would be housed the toilet and locker rooms, as hereinafter described. This wing should be the same height as the manufacturing building and in addition to the toilet and locker rooms, should have a passageway which would give access from each floor of the original plant to the corresponding floor of the new unit. In other words, the new unit of a plant under enlargement should parallel the original unit at a distance of 40 to 50 ft., the two units being joined by the common service wing. The site should be so chosen and the original layout so made that extensions to lumber storage yard, dry kilns, sidings, etc., would be logical developments of the above plan.

The above sectional or unit plan of plant enlargement has another feature which may be valuable under certain situations in that with a series of multi-storied buildings, joined together as described, there are two possible methods of arranging separate departments or groups of departments which are closely allied. They may be separated either vertically or horizontally, in other words, one department or group of departments may use the several floors of one building or they may occupy the same floor in two or more buildings if this arrangement seems to be more satisfactory.

Generation and Transmission of Power, Light and Heat

On account of the large amount of refuse from most furniture factories, which is available for fuel, it follows without much argument that in, by far the majority of cases, it will pay to erect an isolated power plant, unless capital is limited or the plant be very small. The power plant of any industrial institution is deserving of the most careful thought and study on the part of the designing engineer. The almost uniform practice in the past, and in fact the too prevalent custom today, is to treat the power plant as sort of a necessary evil and install the cheapest equipment that money can buy. The only excuse for such a procedure is the fact that most furniture factories supply the large part of the fuel from waste and consequently the owners feel that it is not economy to purchase good efficient machinery. With the increasing cost of coal, however,, this excuse, if it may rightly be termed so, is disappearing and a well-designed plant for the production of light, heat and power is coming to be recognized as decidedly a paying investment.

The first decision to be made in starting the power plant design is the method of transmitting power to

*Second installment of address before American Society of Mechanical Engineers.

the various machines in the factory. In by far the majority of cases, the most efficient method of transmitting power from the prime mover to the principal machines in small and medium-sized plants is by means of shafting, pulleys and belts. The principal machinery in a furniture factory is almost always in one department, the mill or machine room, and consequently the larger portion of the machinery can be driven by belts from one, or at most two, lines of shafting. Electric individual or group driving of machinery is unquestionably the best and most economical where machinery is widely scattered, or where some of the machinery is operated only part time, but where most of the machinery may be arranged in one department and the majority of it is operated at all times, the initial expense and overall efficiency of driving from line shafting take precedence over the electric drive.

Placing the Lineshaft

The location of the main lineshaft will depend on the arrangement of the machine room or rooms. Where practically all machinery can be located on the main floor an excellent design is obtained by incorporating a low basement in the building and placing the main line shaft or shafts on concrete piers in this space. By using wedge and lateral-adjustment bearings the shafting can be maintained in perfect alignment and many of the breakdowns incident to poorly supported shafting will be avoided. This arrangement has the additional advantange of removing all overhead shafting from the machine room, the individual drives to machines coming up through the floor, and it also admits of easy access to all bearings, pulleys, and belts without the use of ladders, thus materially assisting in proper attention being given to maintenance. Where it is necessary to use ladders or scaffolding to make repairs to shafting and equipment, it is but human nature to neglect this work until it becomes unavoidable, consequently any arrangement which will make such repairs and adjustments easy will be found profitable.

Electric Drive Advantageous

If due to the arrangement and location of machinery it is necessary to place machine rooms on two floors, the most logical position for lineshafting is on the ceiling of the lower floor, for this permits of driving machinery on both floors from the same lineshafting. In this case additional headroom should be allowed on the lower floor, 13 to 14 ft. in the clear being usually sufficient. Provision should also be made in the design of the building for supporting the main lineshafting, the joists being increased in size to not only carry the additional load but also to provide a structure as rigid and as free from vibration as possible. A good method of designing the floor structure of the building is to place the main girders or beams longitudinally and the joists transversely, about 4 ft. apart. Every other joist may then be increased in size to carry the lineshafting drop hangers. This arrangement of joists also has the advantage that when cutting holes for belt ways through the floor it will be unnecessary to cut the joists and thus weaken the floor structure. The only objection to this arrangement of girders and joists is that it throws the floor loads into the curtain walls between pilasters and thus necessitates heavier lintels over window and door openings than would be the case with girders running transversely and joists longitudinally, as is the usual practice.

In large plants with widely distributed machine rooms, or where there are several isolated machines to be driven, the electric individual or group drive is practically the only means of transmitting power efficiently and economically. In some plants a combination of lineshaft and electric drive may prove advantageous, but each plant is a problem in itself, the decision being made upon proper consideration of the various factors involved and no general rules can be laid down to govern such decision. In driving woodworking machinery electrically it will generally be found the best plan to arrange the machinery for driving purposes in groups, all of each group operating for about the same period of each day. In this way the initial expense for motors is kept to a minimum and also each motor driving a group of machines is kept more uniformly loaded to near its rating. Where certain machines are operated but intermittently or require a comparatively large amount of power for driving, then the individual motor drive will undoubtedly be found the most satisfactory and economical.

Upon deciding on the method of transmitting power to the various machines the next step will be to select the proper type and capacity of prime mover. The capacity may be determined by taking a total of the power required to operate each machine, as furnished by the manufacturers, assuming that there will be periods during which all machinery will be in operation. This total will give the "connected load," making no allowance for power lost in transmission.

Figuring Load Factor

The load factor in most furniture plants will average from 75 to 80 per cent of the connected load. An estimate must then be made of the power consumed by power-transmission equipment, consisting of shafting and belts or electric drives, and by adding the connected load, corrected for load factor, plus an allowance for mechanical efficiency of the prime mover, the indicated horsepower capacity required to furnish the plant with power may be determined. The electric load and lineshaft load should, of course, be kept separate in order to terminate the generating capacity required, also the electric lighting should be laid out and proper allowance be made both in the generator and prime mover. Unless it is expected that extensions to the plant will be made in a short time, the engine should be so chosen that it will deliver the required indicated horsepower when loaded to about 75 per cent of its rating. This will allow a fair margin of growth of the plant before an additional power unit is required, and at the same time the engine will be operating under an economical load from the beginning. Having determined the capacity the type of prime mover must next be decided upon, and if part of the machinery is to be driven from lineshafting, then the choice will be with some type of reciprocating engine.

In all but the very largest woodworking plants the demand for low-pressure steam for heating and drying purposes forms such a considerable portion of the exhaust steam available from the engine and the waste from the plant makes up such a large part of the full supply that it is uneconomical to operate condensing, at least during the larger part of the year. As the space in this paper is not sufficiently large to discuss all the factors effecting a decision to operate condensing at all periods of the year, it will be assumed that we are treating of the small or medium-

sized plant where it is seldom if ever found economical to operate condensing, at least during the heating season.

Keeping Down Power Bill

The low-pressure steam requirements for dry kilns, heating, etc., should be determined and a curve drawn showing the average demand for low-pressure steam throughout the year. It is apparent that the largest demand will be during the winter months at the height of the heating season and will gradually taper off to a minimum during the summer months. Assuming a steam consumption of 26 or 27 lb. of steam per indicated horsepower per hour for the ordinary Corliss type of engine and that 85 per cent of the exhaust will be available for heating and drying purposes, a curve should next be drawn showing the average available exhaust steam for the various months of the year, and upon comparing the two curves it will be seen at a glance during which periods of the year the heating and drying demands exceed the exhaust from the engine, or vice versa.

In most furniture plants the exhaust from the engine will exceed the requirement for low-pressure steam during the summer time and it therefore becomes a question as to how valuable this excess of exhaust steam is and how great an investment is warranted in cutting it down to the minimum. From a knowledge of the total steam requirements of the plant the amount of fuel required can be calculated, assuming that 20 to 25 per cent. of the lumber cut finds its way to the boiler room as refuse or waste, and that the fuel value of the wood is about 20 per cent of that of the average bituminous coal, weight for weight. It is then a simple calculation to determine the cost of evaporating the excess of exhaust steam during such periods of the year as this excess exists. Any saving effected by reducing the amount of the excess exhaust steam, which would go to waste, should not only pay all fixed charges on any investment made to reduce this excess but should also pay a return of at least 20 per cent per year on this additional investment. As briefly outlined above, then, it is fairly easy for the designing engineer to determine how economical an engine it will pay to install and whether it would be profitable to operate condensing, say, during the summer months, or to install other means of utilizing or reducing the excess of exhaust steam, thus effecting a saving in the coal pile. The type of engine best suited for driving a lineshaft load where efficiency, economy and continuous operation are permanent considerations is probably the slow or medium-speed releasing-gear simple Corliss engine or the poppet-valve engine, which latter is similar in most respects to the Corliss except in the valve gear.

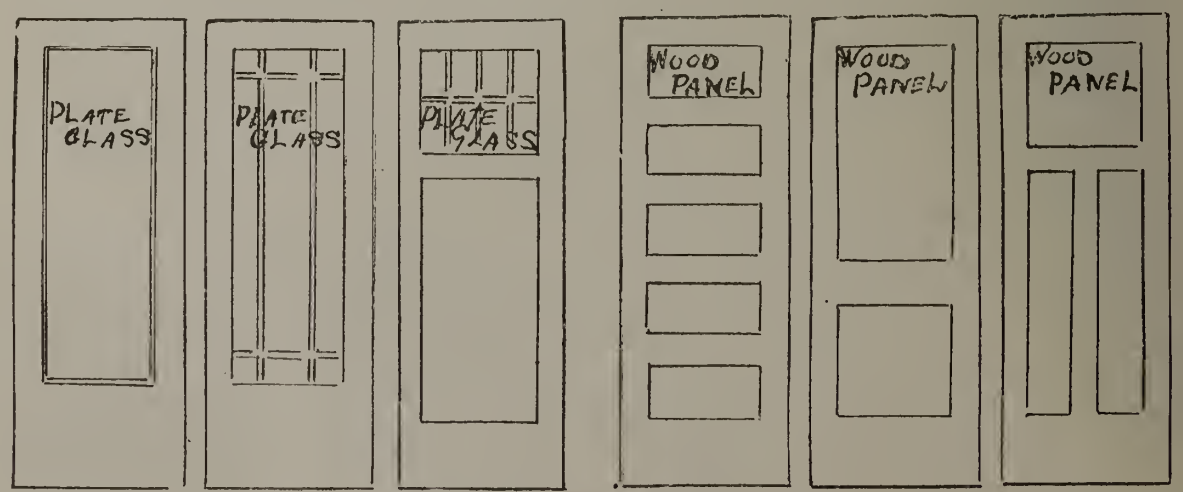
Is Demand for Small Houses on Increase?

Highly Trained Designers Specializing on Small Homes—Millmen Should be in Position to Satisfy Requirements of Clients—Woodwork Adds Charm and Attractiveness to Home

By W. H. Shaw

In the future our dollars will have to be really earned. The era of national and individual extravagance would appear to be over. The wealth in circulation during the last few years has been out of proportion to the wealth produced by this country. The problem now is to more nearly equalize these two factors. There must be expansion and this must be in staple lines. There is always money for necessaries, and until this field is served absolutely, diversions and luxuries will have to wait their turn. The links of business are so joined that the first slackening in the purchase of motor vehicles really was an indication of the physical fact that we had just about come to the end of our era of extravagant spending.

Should we own a home before an automobile? It is a curious commentary on the times that while people maintain that they cannot afford to build homes, or even to buy them—unless that is the only feasible way to keep a roof over their heads—yet many seemingly can afford to buy and to pay the running expenses of an automobile. Building costs, compared with prices of a few years ago, are high, but so are automobiles, especially in first cost, and the price of gasoline and the cost of everything to keep them run-



Types of inside and outside doors.

ning is constantly advancing. The purchase of an automobile is only the beginning or first cost and the depreciation in value is rapid. The money put into a home is an investment. Piece by piece, the situation in the matter of automobiles and of home building parallel each other both as to the cost and the difficulties that stand in the way. The normal life of a well-built home, which receives a little care and attention from time to time, is twenty-five to forty years at the least and may be a hundred. Its investment value does not lower at least for ten years, but what is a $3,000 automobile worth after five years' service?

Should Place Home First

In the final analysis it comes back to what a man chooses. Many cannot buy both an automobile and build a home. One must have a place in which to live. How long will the sober judgment of the people allow them to rent a two or three-roomed apartment in which to sleep and eat, while they buy an automobile in which they expect to live. It is the psychology of the times which has allowed the mind to be so perverted. In the meantime the large proportion of the building which has and is being done, comes either in the class of apartment houses, or apartment hotels, or some type of garage, or automobile equipment. Such buildings have repaid the investment with satisfactory interest. People continue to pay higher and higher rents and they also continue to buy automobiles—but, apparently, the change is now upon us.

It is very improbable that rents will come back to so-called normal, even after the walled-up stream of building begins to flow again. When people have lived huddled in small apartments for a time they will have learned many things, both as to increased convenience and inconvenience, all of which will help in planning the new small home in demand to-day. Never before has so much thought been expended on the small home by highly trained designers. The wise man will have his plans made ready so that he can start his building as soon as he sees his way to do it.

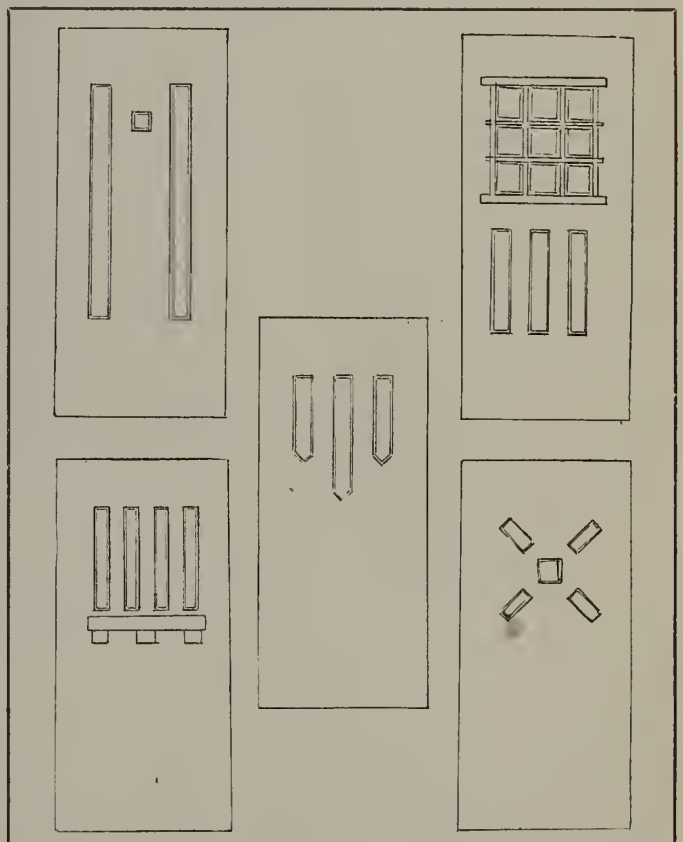
Requires Careful Consideration

When the cost of building can be approximately estimated in terms of the cubic foot of contents under the roof, one may realize what an important element is the size of the building, area and height taken together. Next to size comes the matter of simplicity, of construction. Every additional corner or unusual angle in the construction of a home means additional labor for the workman; the cutting of material, especially lumber, which usually means that small pieces are wasted and the general slowing down of the work until the unusual parts are out of the way.

One of the most important features of the real attractive, well-designed house is the trim or woodwork, as it is familiarly called. Carefully selected woodwork combines the three essentials,—comfort, beauty and utility—and lends a warmth and feeling of life to the home. Outside it is the finishing touch in the form of an inviting porch, door or attractive window. Inside it is the door with its becoming panels, the mantel, bookcase, built-in sideboard, breakfast nook, window seats or stairways. To the builder it is one of the most important features of his construction programme and for that reason is of considerable consequence. Upon it depends much of the satisfaction of his client. Likewise it is important to the millman, who is continually consulted by people in his community who are planning new homes. The choice of millwork is left to him in many cases, and he can make the proper selection if he is acquainted with the details of the material. The days of "soft selling" are over and the sooner the millwork industry realizes this fact and gets on a modern, post-war basis, the more rapidly will come the prosperity with which it is bound to be blessed.

Door Important Feature

Great strides have been made in the standardization of millwork during the last few years; and now most millmen carry a certain stock line on hand at all times, so that there will be little delay when the order is placed with him. Of this type of material exterior doors are, perhaps, as important as any other item.



Suggestions for attractive outside doors.

Attractive doors are largely instrumental in making attractive homes. Invariably, the first favorable impression gained by visitors is due to the distinctive doors which are everywhere so evident. Two essentials of a good door are strength and design. These doors can be manufactured in a variety of designs; as some of the cuts show. There is the all-wood door with its variety of panels, and the wood door with its different kinds of glass panels. There is the French door with its expensive glass front and a great many others too numerous to mention. Slab doors are very popular because of their distinctive appearance and their sanitary construction, there being no horizontal surfaces to collect dust. In connection with the front doors, especially in Colonial houses and Colonial bungalows, the sidelights are manufactured in a variety of attractive designs.

Interior doors are important because they form a large part of a harmonious picture. They are in a sense furniture, and should be selected accordingly. Colonnades are another feature of interior trim that demands the careful consideration of the builder who is seeking to make his handiwork as attractive as pos-

sible. They, like doors and windows, are furnished ready to set up by the millman and are made in a variety of designs.

"Build Now," Slogan of Woodworkers

Mr. Millman, are you talking spring business with your clients now? Why wait until it is too late? Perhaps never in the history of our country have the people as a whole been as interested in the building proposition as they are to-day. What class of small house will be built in your locality or in the country at large? Psychologists assert that there is very little hard, cold judgment in the world. Most people are ruled to a large extent by their feelings. Most people buy or build a certain class of house because a certain type appeals to their reason, because the arrangement of its plan is logical, or because it will give comfort or pleasure to some loved one. A type or design of house of late years which has appealed to young people on account of its charm and older people on its convenience, is the bungalow. With the demand still for small houses, city, town, country and summer home, many will without a doubt continue to build this class of home.

So much discussion has developed over the term "bungalow," its definition and origin, and just what a genuine bungalow may be, that the term has lost its first great significance. Its first lustre has been somewhat dimmed and the issue befogged by the quibble over terms, though the ideal which the term represented has not only remained clear but has developed more definitely, and has now taken its place in the hearts of this nation of home lovers, even more secure than in its early popularity.

Why Bungalow is Attractive

The term "bungalow" at its best, to express it in very modern language, stood for efficiency; conservation of effort, in its saving of steps and labor-saving devices; economical first cost, through building only what the family really needed, without making provision for entertaining, convenience — through the thoughtful use of the latest and best ideas in labor-saving equipment, a positive sense of brightness and of life inside the house, plenty of air, and a pervading sense of cheer, and with all that charm which belongs to the sense of personality at home in its own surroundings.

All of these desired things may belong to the small home, irrespective of its general plan or type. Whether it is all built on one floor or whether it is two full storeys in height is not an essential point. There will be, doubtless, a thousand small houses built for every large house. While many of these large country homes and city mansions are very beautiful, yet in a broad sense the beauty and charm of the country at large depends far more on the character of the small house than the beauty of the large homes. The great streets of palaces on one side cannot counterbalance the slums on the other side.

Sectional Bookcases

A firm in Durban, S.A., dealing in furniture and office equipment, would like to get in touch with Canadian manufacturers of sectional bookcases. Inquiry 2812.

In the States efforts are being made to standardize doors and window openings and the frames that surround them.

Conditions in Woodworking Industry

The anticipated improvement in general business has not materialized. It was confidently expected by many that April 1st would see a definite turn in the tide of events and that from then on there would be a marked increase in demand with a general resumption of business.

In the furniture industry the demand showed an improvement during the first part of March, orders coming in freely; during the latter part it eased off considerably. In spite of that, the unfilled orders on hand at the beginning of April showed an increase o 5% over those on the books of the different furniture manufacturers on March 1st.

Lumber, glass, hardware and other materials required by the furniture industry are still on the downward grade. Glass is probably in the lead, as showing the greatest decline, with lumber a close second. The weighted commody figure representing all materials used in the manufacture of furniture has declined to 244.7, a drop of 100 points. This must not be taken to mean that there has been a reduction of 25% in furniture manufacturing costs as wages have been cut very little and freights and overhead remain at very high figures; in fact as the volume of business is below normal, the proportion of overhead expenses shows a considerable increase. Practically all furniture factories are operating though at reduced capacity. Business is very spotty, some plants being busy one week and nearly idle the next. Those manufacturers who brought out new designs in medium-grade lines are meeting with fair success.

In the sash, door and millwork field business is very erratic. The woodworkers in certain towns find a strong demand while in the neighboring municipalities business is very slack. In the Maritime Provinces the woodworking plants at Amherst, Truro, Moncton, Fredericton and St. John were busy during March while those at Sydney, Halifax and Charlottetown were quiet. Conditions are better in Quebec; in fact, this is the only province reporting a larger volume of contracts awarded during the first three months of 1921 than in the corresponding period of 1921, the figures being $14,250,000 for January, February and March, 1921, as against $13,914,000 for the same months of 1920. With the exception of Quebec, the woodworking plants in the various centres enjoyed a fair volume of business. The same holds true of Ontario. Many of the plants are working full time while others are operating at reduced capacity. In Toronto there seems to be a marked improvement in the demand for millwork of all kinds, practically all the planing mill men reporting a gratifying increase in the volume of business offering. On the Coast conditions seem to be fairly quiet, the reports received indicating that the woodworking industry in British Columbia is experiencing a period of marked inactivity.

Figures recently issued by the MacLean Building Reports, Limited, covering the first three months of 1921 show that the total value of residential contracts awarded during this period to be $8,763,600, as compared with $8,869,200 for the corresponding period of last year. This shows a decline of some $75,000. For business building, that would include stores, warehouses and other structures of a similar nature, the figures are $17,902,500 for 1921, as against $18,702,300 for the first three months of 1920.

Train Foremen to be Better Managers

Greater Efficiency Demand of To-day—Eliminate Waste by Remedying Cause—Foreman in Ideal Position to Function as Efficiency Engineer

By P. L. Burkhard*

If the company is to reduce its production costs it calls for greater efficiency than ever before. This is not the time to let up. It is the time to buck up. If unit costs are to be decreased in the factory, wastes must be cut out. It should be evident from this that foremen can no longer take the attitude that "it doesn't matter." It does matter. Prices are high to-day partly because of industrial waste and partly because of inflation. The banks can take care of inflation—they are now slowly forcing deflation—and index prices show that already there is some drop. We must take care of the industrial wastes ourselves, because that is the biggest part of our job. What are we going to do about it?

The elements of industrial activity which may be either utilized or wasted are (1) man's time and energy, (2) machine and equipment time and energy, and (3) materials. These three elements sum up the industry itself. When a worker does four hours' work in eight hours, or expends his energy through unnecessary operations or in some useless manner, a waste may be charged against him. It is likely that if a worker is wasting part of his day he is also wasting the time and energy of more or less equipment. A machine not operating or running idle is generally a waste which is unnecessary. Of materials too much cannot be said. We may grant that every shop has its scrap, cut-offs and rejects, but who knows how little scrap is actually warranted? The foreman who wishes to function as an efficiency engineer in his own department should strive to reduce the quantity of scrap to its minimum. The importance of this is also reflected in the quality of the product which passes inspection. He should strive to get the most out of the machines, tools and equipment in his department. He should strive to win the co-operation of the men in his department so that they will utilize their time productively. This does not mean that he should attempt to speed them up, but rather show them how to accomplish more with the same amount of effort and energy. It is well directed energy which brings the greatest results. Mis-spent energy wears a man out more quickly than energy which produces output.

There are two serious obstacles which confront the foreman who makes up his mind to eliminate the wastes which exist in his own department. The first is his viewpoint. When a man has been on a job for a number of years, no matter how good he is, he just naturally gets into a rut. He cannot see conditions in their true light. He loses his sense of values. Most men can go into another man's department and see what the trouble is. Unless they are trained by experience in efficiency work they won't see all the trouble, but they will see enough to venture an opinion as to what the other fellow should do. But when it comes to a man's own job! He gets so close to his own problems that he cannot see them. It is particularly hard for a department head to see the wastes of his own department in their true proportion. To overcome this the foreman must get a bird's-eye view of his job. Me must get far away from it to see it as it is. He must realize that simply because he does a thing in his own way that it is not necessarily right. He must be able to analyze and weigh the facts. In other words, he must get the viewpoint of the industrial engineer.

The second obstacle that the foreman meets is that effects loom up larger than causes. The system under which he broke into his trade, from apprenticeship to an executive position, has been one which places stress upon effects and forgets causes. The reason for this is that manufacturing has not been scientific in any sense. Factories just grew as the proverbial Topsy. There was no undertaking of that type of management which to-day may be called scientific. The best we can say about it was that it was rule-of-thumb from start to finish. Causes for industrial wastes were unthought of, the wastes themselves were not seen. The rule-of-thumb manager and his foreman thought they were working efficiently when they remedied effects. I can best illustrate this by mentioning that at one time rule-of-thumb physicians relieved patients having a high blood pressure by bleeding them. To-day the more scientific physician prescribes a diet. In other words, to-day he is getting down to causes. In the same manner the foreman who undertakes to reduce or eliminate industrial wastes must get down to causes.

The causes of industrial waste may be traced to one or more of the following reasons: (1) Lack of a well defined purpose, (2) absence of essential data, (3) non-standardization either of product, conditions, operations, instructions, (4) planning too vague and general, (5) lack of control, (6) inadequate incentives, and (7) lack of co-operation. From these causes we may deduct the principles which govern business and industrial efficiency. The principles are basic and adherence to them will remove the cause which may be permitting waste in one form or another in the plant.

Failure to move material may be due to lack of planning. Backtracking may be due to non-standardization. Operators may be producing sub-normally due to the lack of planning, data or more probably lack of adequate incentives. In any case, if we get down to causes we are in a position to get a more effective productivity.

Therefore, if the foreman is to function as the efficiency engineer in his own department, he must train himself to get the right point of view, the viewpoint of the industrial engineer; he must learn to concern himself with causes and not effects. Then he will be in a position to locate industrial wastes which are common to all industries and which occur in his own department. As he gets a working knowledge of the principles which govern effective production he will become keen in his ability to measure the wastes which occur, ascertain the cause, and correct the condition, by striking directly at the heart of the trouble. He will then verify my statement that after all it is the foreman who is the logical efficiency engineer.

*Burkhard Griswold Co., Cleveland, Ohio, Industrial Training Consultants.

Can You Make Perspective Drawing?

Ability to Make Sketches Valuable Asset for Foreman and Superintendent—Simple Method Outlined

By S. E. S.

The ability to make oneself understood in giving out orders in a plant, is a quality that few foremen possess. In the following article, the writer will endeavor to offer and explain a method, which, if adopted will aid greatly, not alone in time, but will help your men to see in their minds' eye an article as you see it yourself. The practicability of rough sketches in giving out work has long been practised, but to be able to make a projection in the perspective, is truly worth while.

It is a fact, that a good many workmen are not able to read mechanical or architectural drawings, when made separately in plan, elevation and section. This is especially true of small details and objects which have to be considered as a whole. It is vastly quicker for the detailer to make an offhand perspective of the object and mark the dimensions, than to make the usual three drawings. If it is necessary to explain the work in hand, it can be better understood from the projection anyway. As the underlying principles of perspective drawing are not understood by many men, who have a natural ability for offhand work, and as they are quite simple for this elementary work, I will endeavor to set forth enough of them to enable the foreman or draftsman to make such drawings, as are shown in this article.

Perspective Defined

In the first place let us not get perspective mixed with isometric drawings, which are also employed in the same sense, but which are used more for patterns and intricate machine parts. In the isometric drawings, the opposite lines are parallel, and this gives the impression that the object pictured is too large at the further end. To correct this, and give the eye the true idea of distance, the opposite lines of the perspective drawings, converge to a point somewhere beyond the object at which we are supposed to be looking. The points, at which the lines come together, are what we call "vanishing points."

Fig. 1 illustrates how this is done, and at the same time gives a haidy way of making perspective sketches with first-hand instruments. The straight edges and the manner of their use are illustrated. If a man should like to make perspective sketches, and has trouble getting his lines to run in the right directions, he may acquire the right hang of it by using the simple plan as set forth in Fig. 1. Then follow with ink or colored pencil if desired. The idea of the straight edges is to facilitate the speed with which the perspective drawings can be made by having them always hooked over the brads at the two vanishing points.

When making simple drawings for shopwork it is not necessary to use more than two points, and their location is mentioned further on. It will be noticed that the brad holes are in line with the edges of the ruler or straight edges, and this side should always be used for a guide in making the marks.

Outline of Method

Fig. 2 shows the method of finding the middle of centre of perspective plane. The projection from this centre may be made upward with a triangle or along the perspective line, as the case may be. Good judgment will often allow one to do this offhand when he knows where the lines should be drawn. It will be seen that the convergence of the lines toward a common point is the thing which gives the sense of proper size for any given distance, so we must locate our vanishing points in such relation to the body of the drawing that the required parts to be shown will not be covered in developing the drawing. It is well also not to overdo the matter, as has happened in figures 3 and 5.

While not technically correct, it is common practice to make all the vertical lines perpendicular to a base taken from a T square. If such is shown on the top of a figure, it will cause the bottom to show rather wide, as is seen in Figs. 3 and 5. A good comparison is shown in Figs. 3 and 4, in which the legs are vertical throughout. In Fig. 3, the legs seem to spread at the bottom, while in Fig. 4 the discrepancy is hardly noticeable. The latter shows comparatively little of the top, yet enough to receive the dimension marks, while in Fig. 3 so much of the top is shown as to entirely conceal one leg.

Details May Be Included

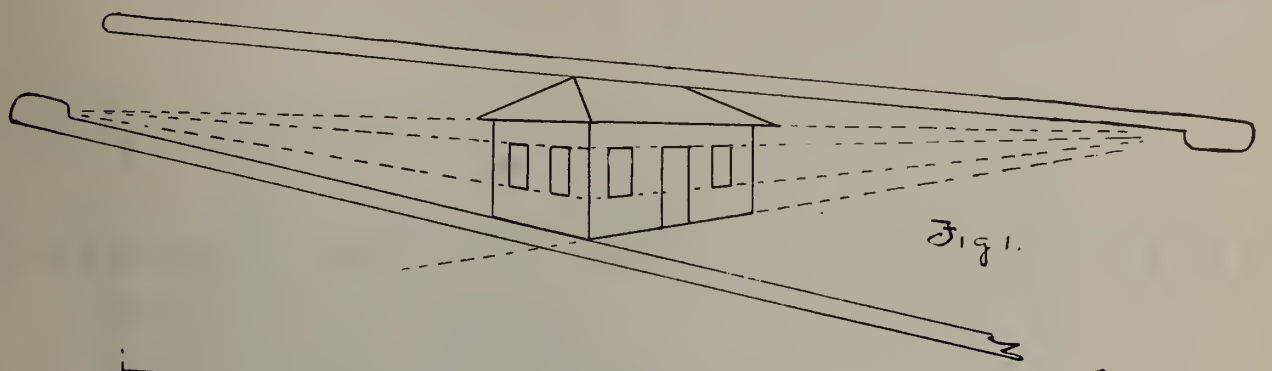
Detailed sketches like Fig. 6 may accompany a sketch of the table, showing how the apron is mitred at the corner of the leg. Such details as these serve as reminders of the method to be followed. If the job contains anything which might be new to the workman, it should be explained by word of mouth and the drawings and details gone over carefully once or twice to be sure he has caught the right idea and is able to successfully carry out the work, without spoiling stock.

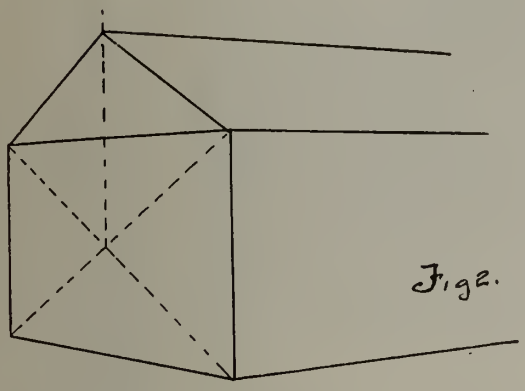
Fig. 7 shows a common wood box. This sketch with a bill of stock is all a workman should require to complete the job. Fig. 5 is a chest of drawers and needs only the marking of the dimensions and a stock bill in order to have the work go forward to completion. In this connection most factories have an established set of methods or fixed ways of assembling or doing things in the way of cabinet work, so that when a sketch is handed to a workman he is only interested in the dimensions. The details of construction will be taken care of by him.

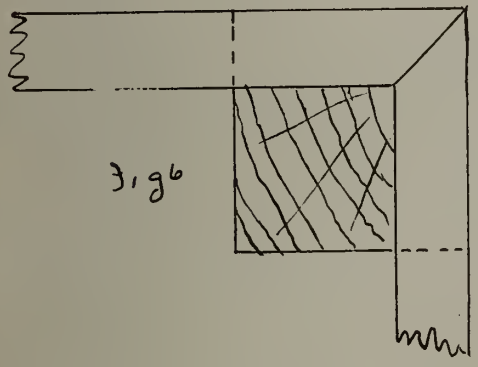
It will be understood that the cutting bills for these pieces will furnish such information as does not appear on the sketch, or, perhaps, turn it around. The drawing should furnish the information not to be found on the cutting bill. The two, taken together, should tell how to complete the work. Then again, if the information cannot be grasped by the workman, he should be instructed in an easier style of drawings, so that when he comes to such difficult ones as architects' details or details of cabinet work, he will have a better idea how to go about his work.

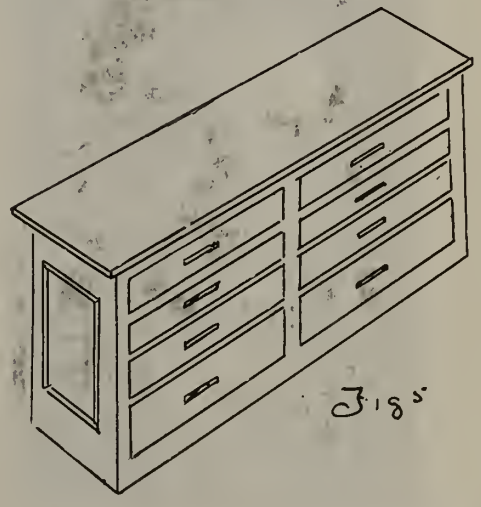
Determining Height and Length

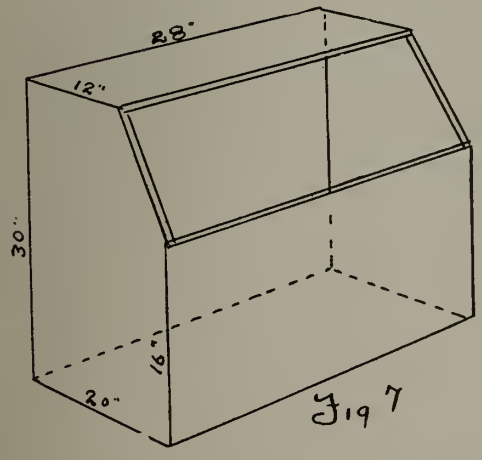
It is not necessary to make these sketches even as good as they are in this article, and these are rough enough. All the offhand sketches used in the shop are

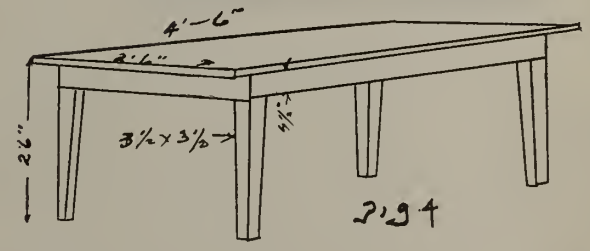












Suggestions for making perspective sketches.

usually made with a pencil and one need not be so careful at the intersection of the lines as a line made too long can be easily erased.

The hardest part for the beginner is to make the up and down lines look right, more especially on longer sketches. This is true where he is compelled to start them away from the angle or intersection of the top, as in case of the table legs. A good way to locate these lines is to draw a light line on the top of the table as far as the projection of the top is to be, and all the way round. The corners of the legs will drop from the corner of the line and so give the beginner a start in locating the legs in right place. The length of the legs or extreme height of any perspective is found by drawing a light line from the bottom of the nearest leg and to each vanishing point, then bringing the two legs down to them. The farther leg is located by the intersection of two lines each running from the farther leg to the vanishing point, as shown in Fig. IV.

The one thing to remember in this work is that it is but a means to an end and is not of great importance as to the quality of the drawings so long as they serve to convey to the minds of the workman what is meant by the bills.

Architectural Service Builds Goodwill

Planing Mill Operator Considers This Valuable Department—Results in Many Nice Orders—Pays to Go After Business Aggressively

The McKinney Lumber Co. has developed from a small beginning into a go-ahead, fair-sized industry and while it does a large retail lumber business, it has found that the contracting end is an active element. "In fact," declared Mr. McKinney, in conclusion, "it is the life of our business. To it there is no limit, and if one is alive at all times, there is no need to be idle."

"We find a great boom to our business in our architectural department. We make our own designs and believe we secure a lot of business by this means

A. J. McKinney, McKinney Lumber Co. Woodstock, Ont.

that otherwise would slip away from us," said A. J. McKinney. As an instance of what such a service and department gain, Mr. McKinney says that he met a farmer on the street a few days ago, who asked him what it would cost to build a cottage 26 ft. x 30 ft., four rooms—two bedrooms, a dining room and a kitchen. Mr. McKinney inquired when he would be going home and received the reply "about 4 o'clock in the afternoon." He was then requested to call at the office before his departure. When the farmer drove up, Mr. McKinney says they had ready for him a neat little design with floor plan, elevations and complete specifications. The rural visitor was so surprised and delighted that the McKinney Lumber Co. got his business at once.

Another interesting illustration is furnished by the McKinney Lumber Co., who state that about a year ago a farmer was burned out at six o'clock in the morning. He drove into Woodstock and called at the lumber company's office early in the afternoon. A member of the firm went out that evening, and took the measurement of his foundation, which was not destroyed. The next afternoon the farmer, his wife and family and a friend who had just built a new house, came into town. "We took them," continued Mr. McKinney, "into our draughting room and with their help designed their new home, got their business the same afternoon and the next day the farmer was drawing material away for his new home. We find that this architectural department works well, not only with farmers but with school boards, church boards and, in fact, anyone who is building."

Mr. McKinney, whose yards and mill are located at the corner of Ingersoll Ave. and Riddell St., Woodstock, has had a long and practical experience with the lumber and construction line. His father was a framer and bridge builder. The subject of this reference went into the bush when 12 years old. Two years later, being left alone and the oldest of a family of four, he had to get his back to the wall and put up a hard fight. Arriving in Woodstock 22 years ago he worked as a carpenter and foreman for a local contractor until 1910, when he launched out in the contracting business on his own behalf.

In 1912, finding more capital necessary for the extension of his business, he took in a partner and organized The McKinney Lumber Co., Limited. The partnership lasted for one year when, by mutual consent, he bought out his partner's interest, still leaving the concern as a joint stock company. Business has kept increasing, and more enlargements were made to the plant until the last Sunday morning of 1919, when the entire mill and contents were destroyed by fire. Mr. McKinney and his associates had faith in the future of the business and turned their whole force the next morning to reconstruction. In two weeks' time they were able to move into the new planing mill building on the old site. This is a two-storey structure 60 ft. x 112 ft., fully equipped, together with a closed lumber shed, also two storeys high, 50 ft. x 80 ft. At present the company is building an addition 50 ft. x 60 ft. to their shed and a new office and storage building 50 ft. x 26 ft.

Organized for Maximum Production

Large Quebec Plant Employs Modern Methods—Bonus System Increases Output—Departments Maintained at Highest Efficiency—Interesting Description of Organization

The Brompton Lumber & Manufacturing Company, Bromptonville, P. Q., was organized in October, 1919, to take over the plant of the Tobin Manufacturing Co., which had been closed for several years. The factories have been completely overhauled and additions made, and a large amount of new equipment installed. The result of this reorganization was a large volume of business; about 14 million feet were dealt with during the last twelve months in one of the most up-to-date and largest woodworking plants in Eastern Canada.

Woodworking plant of the Brompton Lumber & Mfg. Co., Bromptonville, Que., showing one of a battery of kilns on left.

The plant is situated on the St. Francis River, five miles from the city of Sherbrooke, with Grand Trunk Railway sidings alongside the mills and right into the yards, which are divided into two sections, one for hardwoods and the other for softwoods. The plant consists of a planing mill and re-sawing equipment, with a capacity of over a million feet per month; a hardwood flooring mill, with a capacity of 200,000 ft. per month; a moulding mill; a sash and door and interior trim factory, with a capacity of 200 doors per day and 500 sashes; and a wholesale lumber department. Besides these, there is a sawmill at Stoke, seven miles from Bromptonville, and another sawmill at St. Francois Xavier, also seven miles from Bromptonville in another direction. The company, through Mr. E. W. Tobin, the president, have connections with several large sawmills in Eastern Canada, which he controls.

Efficiency Department Watches Production

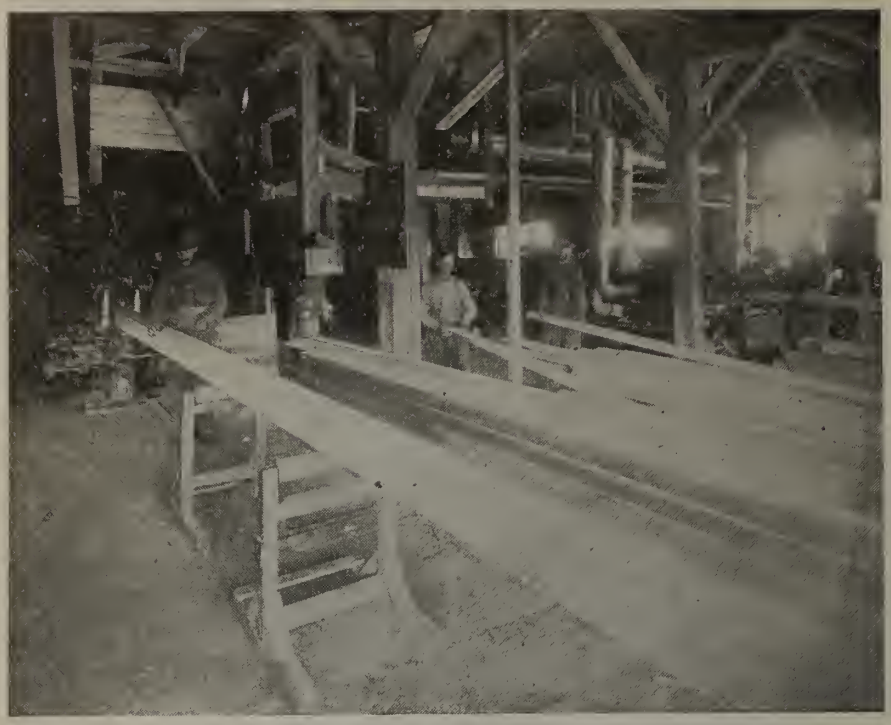
The entire plant is laid out on a systematic plan which has for its purpose the rapid despatch of orders and the maximum of efficiency in all departments and operations. In order to acquaint each department with its duties and the relation of the department to the other departments, the management has devised an "organization chart" which tells at a glance the definite duties of each; also the persons in charge, their position, their assistants, etc. The management is thus relieved of much detail work, and is always in direct touch with the working of the organization, since all heads report to a superintendent who, in his turn, confers with the management.

It is interesting to note that there is a department called the "Efficiency Department," which comes directly under the manager's supervision. Mr. Germain created this department early last spring, and states that he is pleased with the results obtained. As the name implies, this department is for the sole purpose of recording productions of departments and machines, to watch for leakages, wastes, etc., and to apply proper remedies. The head of the department receives his orders from the manager only and he has access to all parts of the plant, stores, offices, etc.

Record of Output and Idle Time

To obtain the maximum of production output from the several machines through the plants, each machine is fitted with a meter showing the number of feet manufactured daily. These figures are recorded every morning in the manager's office on a large chart, together with the total idle time of each machine. The chart shows the minimum allotted the machine, daily and monthly, and if the output is above the minimum at the end of the month, the foreman receives a bonus in cash, but if the output is below the minimum he is called in for a bit of a personal interview with the manager.

When there is a stoppage of a department or a machine for an unusual cause, such as mechanical defects or breakdowns, the production clerk notifies the manager on a special slip called "Signal for Manager," the cause of the unusual stoppage. If the cause is due to poor supervision of the Master Mechanic he is interviewed and the department affected gets a credit for the lost time, which does not affect the monthly percentage. Mr. Germain states that he has doubled his production in three departments and he has also improved his yard service to a point of great efficiency, as there is now no delays in deliveries of lumber to machines. Every foreman looks out for his supplies. Many men return at night to inspect their machines and put them in shape to start at the first turn of the engine in the morning. When the production is way above the minimum allotted, the bonus is worked on the extra footage produced



View in planing mill, showing Yates band resaw and matcher.

thus encouraging the foreman to do still better every month. Any defective material is charged to the foreman and taken out of his wages so as to prevent slackness or neglect to increase production at the expense of quality.

Perpetual Inventory of Lumber and Stock

The yards have a combined capacity of six million feet of lumber divided in two sections, one for hardwoods for the hardwood flooring department, and one for softwoods for the planing mill department. A third and smaller yard is used for storing lumber used in the woodworking factories such as pine, basswood, clear rough B. C. fir, etc. An unusual system of stock-keeping is in operation under the supervision of the Cost Accounting Department. Every lumber pile bottom bears a number which is never changed and the stock clerk's book contains a sheet bearing a corresponding number and the details of the stock examined in each pile. The stock clerk daily checks up with the piles in the yard the feet in the piles which have been handled during the previous day, adding or deducting the necessary quantities on the corresponding sheet in his book. In order to avoid errors, the yard foreman puts a signal (a piece of thin board painted in red) on each pile handled during the previous day; this the stock clerk collects and brings back to the yard office. The stock clerk enters in another book, called the "Lumber Book" under the proper specie, size, width and length, the changes which have been made during the previous day, so that the Lumber Book is always up-to-date. It is thus easy to ascertain the total quantity of lumber of a certain thickness, width and length. At the end of the month a stock sheet is made out from this "Lumber Book." Mouldings, hardwood floorings, doors, sashes, etc., are also recorded in the same way but under bin numbers instead of piles.

The shipping department, under the supervision of the head shipper and with seven tallymen, comprises twelve double teams, two five-ton motor trucks with semi-trailers, and four single horses for the handling of the lumber buggies in the local yards for the supply of lumber to the mill. When working at capacity, eighty men are engaged in the yards. The lumber receiving department is under the same supervision but it is looked after by the yard foreman only, who directs the location of all lumber received and the way it is to be piled. A standard piling arrangement is recorded on a map and no change is allowed to be made unless fully discussed with the management. This means a great saving of labor and space, besides being very convenient for new hands to become familiar with the yards in a short time.

Testing Lumber Going Into the Kiln

With a view to establishing a good and reliable grade of hardwood flooring every precaution is taken to manufacture a uniform grade of material equal to none as far as finish and dryness is concerned. The kilns comprise a battery of four progressive kilns twenty feet by eighty-five feet each, with a combined capacity of 320,000 feet. No lumber is allowed to enter the kilns before the percentage of moisture content is ascertained. If the moisture content is above

Hardwood flooring grading racks with compartment for each length.

or below a certain percentage it is directed into a slow or fast drying kiln according to the amount of moisture which must be removed. The importance of properly dried lumber for manufacturing purposes is recognized and to that end twice every day a record of the temperature in the kilns is taken from the recording thermometers, the air velocity as recorded by th anemometers, the humidity in each kiln is recorded by the hygrometers, and the outside temperature taken. When a lot of lumber is due to come out a thorough test is made. This test is very severe, the test pieces being subjected to a temperature of 450 deg. F. in an electric oven for that purpose. If the lumber under test shows more than 5.6 per cent. of moisture content it is not allowed out of the kiln.

Hardwood flooring department, trimmers and end matchers in foreground.

The manufacturing is followed throughout in the same strict manner. When the lumber is released from the kilns, it enters the flooring department on rails, where it is delivered to the rip saws. These rip saws were designed by the millwright of the company and differ from the others in the fact that regardless of the widths of the rough boards, the ripping is all done in one operation. There are two receivers to one feeder, as the wide boards multiply quickly on this rip saw. The receivers then place the strips behind the fast matchers, according to their widths. There are two fast P. B. Yates No. 87 hardwood matchers running continually making flooring. The flooring drops on a table alongside the trimmers after which it goes to the two C. M. C. upright end matchers. When the material is end matched, it is fed through an American flooring scraper, making it of uniform thickness. An inspector watches for any change in settings or other variations which might pass the operators. When the flooring is released from the scraper it is trucked away to the grading room, adjoining the large flooring shed. The grading room is equipped with a homemade device which automatically figures out the footage in each bundle without any possibility of error. This device has saved two men in the grading room, and besides several hours' work in the accountant's office. Each bundle is stamped as to the grade and footage.

A Busy Department—Scene in Sash and Door Factory.

Work Done On Special Orders

On the ground floor of the main building is situated the moulding department, which comprises four stickers, P. B. Yates and C. M. C. machines. Three machines are for stock pattern mouldings, and one for special work for the factory department. The stock mouldings are made on a requisition from the stock clerk according to the standing of the mouldings in stock in the large moulding shed. As a bin gets low a production order is made out; this goes to the moulding department foreman who divides the work so as to reduce the number and extent of changes in set-ups to a minimum. The meters on the stickers answer two purposes—they record the lineal footage of the stock run, and provide a record for the stock clerk.

The planing mill is off the main building, and is operated by a separate motor. It comprises one P. B. Yates 341 band resaw, one Montmagny circular saw and carriage for resawing large timbers, one power feed circular table resaw, and two fast feed P. B. Yates No. 91 softwood matchers. The lumber is brought in by lumber buggies and taken away in the same way, when not unloaded from one car and loaded on to another from the railway siding which is situated near the planers. With the trackage facilities

enjoyed and the efficiency of the layout of the planing mill and tracks, this plant can handle milling-in-transit, running the material from one car, through the machines and into another car, with a minimum of handling and a minimum of expense.

200 Doors and 500 Sash Daily

The woodworking factory is situated on the second floor. At the front end there are the offices of the superintendent, the foreman, the drafting room and the cost accountant's office. This department manufactures pine and B. C. fir doors, cupboards, stairs, sashes, frames and special millwork. It is equipped with the latest machinery in "duplicate battery" for quantity production. The benches are located on both sides of the upper floor, where the light is plentiful.

The breaking out department is on the lower floor, where the pine, B. C. fir, etc., is received from a special softwood kiln, on trucks. The factory foreman issues a requisition for every order manufactured, one copy going to the foreman of this department and the other copy to the cost accountant. The lumber is cut up to the size wanted, then sent to the upper floor by an elevator which takes up trucks and lumber, where it is delivered to the marker, who marks the material for the tenoners and mortisers and routes the work throughout the factory. All operations are recorded on the individual time sheet, under the proper order number, and when the article is finished the general office has the entire cost with the completed order. This department has a capacity of 200 doors per day and 500 sashes and frames besides other mill work. Adjoining the factory department, above the planing mill is the veneer department, where veneering of all descriptions is done.

Economical Power and Heating System

The power plant is in a brick building 60 feet long by 35 feet wide. The equipment consists of a 325 h.p. Corliss engine manufactured by the Jenckes Machine Co. of Sherbrooke, and two 125 h.p. boilers fed by Sheldon's refuse collectors. The engine and boiler rooms have been recently rebuilt, and new equipment added. All condensations are collected by an elaborate system of steam traps, which bring the water back to the boilers at a temperature of 210 deg. F. requiring but very little fuel to bring it up to boiling point, thus saving a large quantity of shavings, which are baled and sold as fast as they are available. The heating system throughout the plant is very effective. Besides the steam power there are one 100 h.p. C.G.E. electric motor and one 50 h.p. Crocker-Wheeler electric motor, making a total of 500 h.p. to operate the plant, besides small motors in the machine shop, grinding rooms, etc.

The company also have a steam creosoting plant, where they treat fence posts and timbers for underground construction.

One very active department is a newly organized advertising department, which has inaugurated a plan service. Advertisements are inserted in local papers notifying prospective builders that the company will supply sketches, floor plans, specifications, bill of material, together with the cost, delivered on the job within fifty miles from the plant, if on roads accessible to motor trucks. We understand that several sales of houses have been made already, and the demand for the service is very encouraging.

E. W. Tobin, M.P., is president; U. E. Germain, managing director; J. O. Asselin, secretary-treasurer, and P. Alegre and J. P. Mullins, directors.

Gibbard Team Heads League

The hockey team of the Gibbard Furniture Co., Napanee, Ont., won the championship of the Napanee Hockey League. Owing to the mild season, all the games scheduled were not played, but in the majority of those that were pulled off the furniture team came out on top. The accompanying group shows the team, together with some of the officials of the Gibbard Furniture Co. The following gentlemen appear in this group. Commencing with the top row and running from left to right we find: C. N. Loucks, F. McCullough, J. H. Moffatt, W. F. Vine, H. E. Loucks, G. W. Gibbard. Second row—Fred Huffman, Authmire Pybus, H. Belcher (manager of team), Ross Loucks, Leslie Richardson, Harry McNeil. Bottom row—Gerald Johnston, Ray Huffman, Harold Johnston.

Hockey team of Gibbard Furniture Co., Limited, Napanee, Ont.

Where is the "Joker"?

"Take for example a can of tomatoes on the merchant's shelf. Say this can cost him 15c. Say that that same brand of tomatoes can today be bought by the merchant at 9c. Suppose that merchant sells that can, which cost him 15c at 11c, has he made or lost money? Almost every merchant will tell you that he has lost 4c, when as a matter of fact he has made 2c. For, with 9c of the money that he has taken in can buy another can of the same tomatoes, making his stock exactly the same as before, and he still has 2c more than he had before."—The Canner.

Executives and Labor Efficiency

"From 70 to 80 per cent. of the inefficiency in industry is caused by management and by management I mean executives as distinct from workers and capitalists. Not all the loafing done by workers is due to their wanting to loaf. The worker wants a better and more efficient foremanship. He wants foremen who know their business; who are leaders and not drivers, who are fair and believe in the 'square deal'; who are sympathetic and human; who can interpret the ideals and ideas of the management to them. The economic fundamental in industry today is that there should be a maximum attainment per operation, per hour, per worker. Who will play the leading part in readjustment? The industrial executive."

Some of the small moulding machines earn as much money as the large ones, and considerably less power is required to drive them.

Are These Applicable to Your Plant?

Can the Following Suggestions Taken from a Bulletin Issued by a Well-Known Canadian Woodworker to His Employees, be Applied to Advantage in Your Plant?—Waste Should Not be Tolerated

By W. Warren

"The present time seems to me to be exceptionally opportune to take up with you the necessity of conserving, to the utmost, both material and labor and as far as possible handling our departments, so that a maximum of output may accrue with a minimum of outlay. You are more or less acquainted with the present state of the market. Business is quiet; orders are few and far between, whilst prices have dropped to cost and even below the cost of production. The public seems to be demanding lower and still lower values.

"We want to keep our factory operating and take on all the business that offers, but we are not anxious to take a loss on every order accepted. In other words, we are willing to forego all profit in an endeavor to keep the wheels revolving and provide work for our employees, but we are asking you as an employee to co-operate and assist us in keeping costs down to a minimum.

"There never was a time when greater efficiency was required than to-day. Our plant can only be kept operating at prodigious cost of upkeep; therefore, intensified waste elimination is absolutely necessary if we are to carry on profitably. Waste is a pernicious thing and our value to the firm is measured largely by our ability and willingness to reduce it to a minimum. This can be done in numerous ways; in fact, there is not a single department where it cannot be applied satisfactorily. Economy can almost be termed a virtue, and its steady application becomes a fascinating hobby and gives a pleasure and interest in our occupation.

Greater Efficiency From Dry Kilns

"In the operation of the factory in conjunction with the yard, it is imperative that we have an abundance of kiln-dried material; eighty-five per cent. of the material used in the factory must be artificially dried. We have never caught up in this section. Our kilns, if operated fully, are capable of curing 60 M ft. every two weeks; if less is handled, then, we are operating at a loss, and this loss extends itself to and is shared by the factory and mill, and so becomes a triple loss, slowing up our production and making itself felt in every department. It is, then, of the utmost importance that the same day a kiln is unloaded that it be reloaded and operated at once; otherwise the most expensive kind of waste steps in. We must co-operate in preventing this kind of waste.

"Regarding the storage of dry lumber, heated housing capable of handling 100 M ft. has been provided, and this space must be made full use of, and no kiln-dried hardwood stored except in its proper places. If stored otherwise, re-drying becomes necessary at a cost of $10.00 per M, often deteriorating the lumber.

"In deciding the grade of material to be used, we often allow precedent to step in and control our judgment. All precedents are out of date, and must be discarded. Conditions as they are to-day must be uppermost in our minds and our decisions based thereon. Do not give a customer clear pine for paint purposes, without first acquainting him with his mistake. Do not use clear stock if common will serve the purpose. In brief, supply material suitable for requirements, and so eliminate waste.

Exercise Judgment and Foresight

"Coming to plant upkeep, the line of least resistance is the one we are prone to follow. The price of equipment is out of sight. When asking for a new belt, new knives, repair parts, saws, etc.; before discarding the old, see if it cannot be repaired at less cost than the price of a new piece. In the majority of cases it can, and a very considerable saving may be effected by a little thought and effort in this direction. You can quite easily squander a week's or even a month's wages by ordering something that a little forethought might save. There is room here for waste elimination.

"There is scope in the shipping department to distinguish ourselves by rigid economy both as regards material and labor. One of the most essential points is to see that the trucks and rigs are properly loaded. There is nothing that adds to the cost of shipping to the extent that waiting for a load will do. On close investigation I find that our trucks occupy approximately one-third of their time in the yard. This is out of all proportion and must be remedied. It spells waste of the worst kind. What is true of the trucks is also true of the waggons.

Eliminate Waste Wherever Found

"Another important point in this department is to see that the undershippers leave the piles in the same condition as they find them. When covered, uncover them and take the stock as it it is piled. There is a tendency to throw off some of the top pieces, sometimes because the sun has affected them, and by persistently following this practice, the percentage of waste is alarming. The material thus handled is reduced to culls and often to no value.

"No matter what our position in the woodworking business may be, we shall not be successful unless waste elimination is the uppermost thing in our minds. A man may be an excellent mechanic, but if he is wasteful he is worse than useless and merely a bill of expense. To be valuable to our employers, we should be cranks regarding waste.

"I ask that you give waste your consideration, and let us act in unison to root out any undue leakage."

Commercial Value of Sawdust

Sawdust as a waste product is a thing of the past for it now serves many purposes and has an ever-increasing commercial value. Mixed with clay it makes good tiles and bricks and combined with concrete a good flooring material is obtained. It also finds a place in the dye industry for coloring purposes.

A gas, excellent both for lighting and heating purposes, can be made from sawdust. It is believed that, particularly in the neighborhood of sawmills, the gas could be produced so cheaply as to be supplied for a few cents per thousand feet.

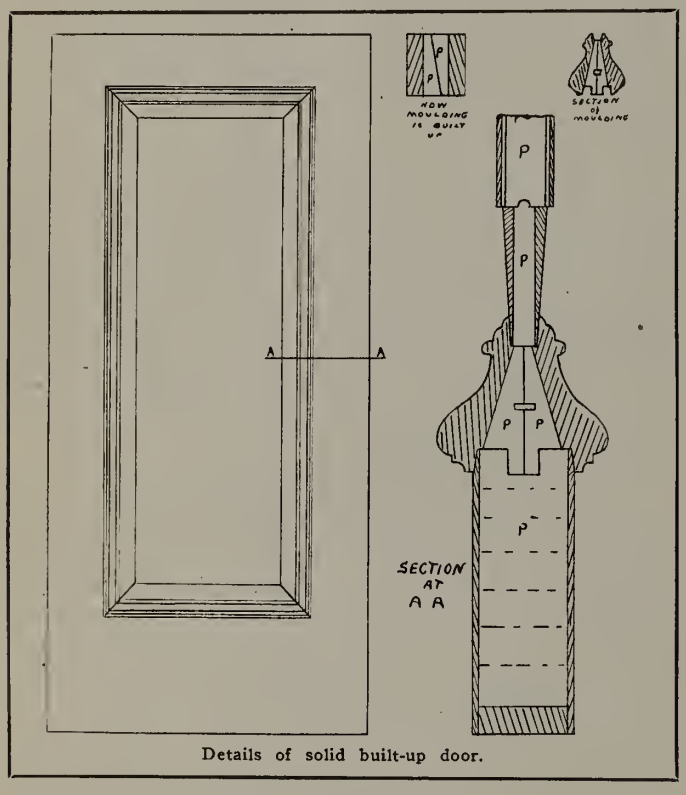
Improved Idea in Built-Up Door Construction

Each Part Made of Laminated Construction—Effects Saving in Amount of Fancy Wood Required—Makes Strong, Substantial Door

By D. L. W.

One of the newer ideas in built-up door construction is shown in the accompanying illustration. These details were taken from a batch of doors, in quartered white oak, being made for a high-class interior fitting job by the R. Laidlaw Lumber Co., Toronto. It may be said to be a real built-up door for every part is of laminated construction.

At first glance one might think that following out this suggestion would entail a lot of extra work, resulting in a very expensive door. Mr. Warren, the manager, says that this is not so. Where a number of doors are going through, he did not think that the cost, when this construction is used, would be any



Details of solid built-up door.

higher than for a door built after the usual fashion, adding that it could not be used to advantage on a cheap or medium-priced product as it was a strictly high-class proposition.

The stiles and rails are built up in the usual way, with a pine core having a strip of oak on the outside edge, and faced with ¼" quartered white oak veneer. These are grooved, mortised and tenoned as usual. The edges facing the panel opening are bevelled slightly. This corresponds to a slight taper to the groove in the moulding and ensures a snug fit for the latter.

The moulding is built up as shown in one of the small insets; that is, oak is glued on both sides of a pine core. It is then slit diagonally through the core on a smooth-cutting rip saw (the reason for using a smooth-cutting saw is so that one of the pieces may be reversed and glued again without jointing) and the groove cut on saw also. The idea of placing a tongue here is to overcome any tendency the two pieces might have to slip when the pressure was being applied, owing to the fact that the two faces are not parallel. Working this way permits of full advantage being taken of the quartered figure in the wood. The completed lengths are now run through the sticker in the positions shown, the two side heads doing the shaping and the under head cutting the two grooves.

The raised panel is built up in two sections, the raised centre piece, which is of five-ply construction, and the outside or rim. The five-ply panel is laid up with crossband and face veneer, then cleaned up and trimmed to the exact size required and the groove run on a shaper. The outside piece of rim is built up and run through the sticker, where it is bevelled and the tongue made. It is then mitered and glued to the five-ply centre section. The advantage of this method is that advantage may be taken of five-ply construction for the panel, giving a stronger, more permanent job and eliminating much of the tendency to warp and buckle, and the raised effect may be secured without using ⅜" or ½" face material which would be necessary if the panels were raised in the usual way by cutting down on the shaper or panel raiser.

In assembling, the doors are first put together without glue, dry joints, and the mouldings mitered and fitted and everything made ready for the final assembling. It is necessary that the panels must be put in as the doors are assembled. The mouldings are glued to the stiles and rails and a dry joint is made between the panel and moulding. The groove in the top of the moulding is tapered slightly to conform to the bevel on the rim of the panel and thus ensure a tight joint.

When built this way, all nails are eliminated, there is no danger of the mouldings coming loose, the five-ply panel will hold its shape, a saving has been effected in the amount of oak used, and a better door produced.

Building on Increase

From figures recently issued by the MacLean Building Reports, Limited, Toronto, it would appear as if the building industry in Canada is getting away to a good start. The figures show that for the first two months of 1921 contracts were awarded for residential work valued at $4,212,000, as compared with $3,810,400 for 1920 and $2,096,000 for 1919. In addition, permits were issued for residential work to the value of $7,123,000. During the same period contracts were let for business blocks, warehouses, office buildings, etc., valued at $13,335,000. This compares very favorably with the figures for 1920 which were $9,880,500. As the prosperity of the furniture and woodworking industry is largely dependent on activity in the building field, it would appear, from these figures, as if the woodworkers in Canada have little or nothing to fear for 1921.

The automatic screw-driving machine has done away with a great deal of hard, tedious manual labor.

D. R. Brewster Defines Good Kiln Drying

Artificial Seasoning Too Important to be Given Scant Attention—Only Ten Per Cent. of Manufacturers Realize True Value of Proper Drying—Competent Operator Big Factor

(Concluded from March issue)

The second class of dry kiln operations might be called the "hit or miss" class. At these plants the importance of the dry kilns in a woodworking factory has been more or less appreciated. Steps have been taken to improve both drying equipment and practice. But action has not been based upon a thorough familiarity with different angles of the problem. Kilns have usually been purchased because of the advice or experience of some acquaintance in the same line of business. Sometimes this acquaintance has been well posted on the subject and has given reliable advice. More often, however, he too has not studied the question thoroughly and his kilns and methods are far from the best for the purpose. Thus, unsatisfactory kilns and methods are passed along from one plant to another. As a result, a large number of factories have found, after spending many thousands of dollars for new kilns, that these kilns are poorly designed and poorly suited for their purpose.

If, by chance, such plants happen to be fortunate in their selection of a kiln, they still have to solve the problem of satisfactory kiln operation. Lack of knowledge of good operation often causes costly blunders even when a plant has excellent dry kiln equipment.

It has been said, in fact, that good kiln drying is 90 per cent. operation and 10 per cent. kiln. Personally, I believe this is overstating the case, and that a good kiln has more of an influence than that on successful results. However, it is unquestionably true that a good operator can do better drying with a poor kiln than can a poor operator with a good kiln. This is not an argument against getting a good kiln simply because you may not be able to get a good operator, for even a poor operator can do better work with a good kiln than he can with a poor one. It is rather an argument for both a good kiln and a good operator as the right solution of the problem.

The "Safe and Sure" Class

The third and most successful class of operations seeks this solution. I have termed them the "Safe and Sure" class. Realizing that a good kiln drying is not only important, but vital to the greatest success of their manufacturing operations, these "safe and sure" plants investigate the whole subject of kilns thoroughly before they finally decide on the type they want. They study the principles of kiln drying and secure unbiased advice and information from government and other research and technical service agencies. They secure catalogues and information from a number of different dry kiln companies and weigh all the statements and arguments in the light of the facts and principles developed in scientific research work. They then decide on the type of kiln best adapted to their needs and select the one which will be most economical in the long run, making the first cost a secondary consideration.

After the kilns are built, these "safe and sure" plants make certain that they will be properly operated by securing a competent and well-trained kiln operator. Since trained and experienced operators are scarce, they have found that the best plan is to select an intelligent, ambitious man from the factory organization and give him special opportunities and encouragement in learning the technique of good drying practice. This can be learned first, by studying the literature provided by the government and sent out by the Technical Service Department maintained by some of the leading lumber companies; second, by studying the correspondence course in kiln drying given by the engineering department of one of our universities; third, by taking the short courses in kiln drying given at some of the forestry schools, or, fourth, by attending the ten-day short course for kiln operators now being given each month at the Government Forest Products Laboratory.

Importance of Intelligent Operation

After securing a grounding in the principles of kiln drying by one or all of these methods, any man of average intelligence and interest in his work will be able to work out the application of these principles to the correct operation of a specific set of dry kilns. As a matter of fact the subject of kiln drying is really neither technical nor complicated—nor nearly so much so as operating an automobile and keeping it in good running order. Yet many thousands of men have become chauffeurs and truck operators in a comparatively short time.

You would not maintain a motor truck without a trained and competent driver. Nor would you become discouraged in the use of a truck because good drivers are scarce. You would either search until you found a good driver, or else develop one. In the same way, realizing that poor kiln operation may, in a very short time, cause a loss several times what a good operator would cost for a whole year, the "safe and sure" plant makes it a point to find or develop a trained man to run its dry kilns.

All along the line—in the yard, in the kiln, in the factory—the intelligent "safe and sure" policy will constantly pay big profits in the seasoning and kiln drying of lumber. These profits will result first, from a reduction of investment in yard, lumber and kilns; second, from decrease of time in drying; third, from smaller losses of stock in the kilns; fourth, from obtaining a steady and dependable supply of raw material for the factory, and fifth, from eliminating loss of stock and labor in the factory due to casehardening, checking, warping and honeycombing. If your plant is already in the "safe and sure" class you are even now benefiting from these profits. But if there is any reason to suspect that you may still be in either the "Hit-or-Miss" or the "Foolproof" class, I earnestly suggest that you give the matter of good kilns and good kiln operation your immediate and careful attention in order that you, too, may benefit from the profits which result from adopting the "Safe and Sure" plan.

But 10 Per Cent. Kiln Dry Right

My acquaintance with hundreds of plants leads me to estimate that at least 50 per cent. of all kiln operations belong to the "foolproof" class. At least another 40 per cent. belong to the "hit-or-miss" class.

Only the small remainder—not more than 10 per cent. —deserve to be classified in the "safe and sure" class. However, I do not mean to criticize the first two classes. They can hardly be blamed for their lack of an understanding of good kiln drying because modern kiln drying practice, as we know it to-day, has been developed only in the past few years.

As a matter of fact, the need for more careful and scientific methods has become apparent only since hardwood lumber has become scarce and high-priced. Not many years ago when plenty of thoroughly air-seasoned hardwood stock could be had at a small fraction of present prices, it may have been more economical to waste part of the stock in poor kiln drying, rather than to go to the expense and trouble of reducing that waste by better kilns and better practice.

Fortunately now that it does pay to eliminate such waste, you will be encouraged to know that it can be done, and oftentimes at surprisingly small cost, particularly to those plants that already have kilns. For good results, it is by no means necessary to scrap the old kilns and build new ones. Even where it would be advisable to do this eventually, it should often be possible to postpone the building of new kilns until building costs go down, by simple alterations in present kilns. In any case I would advise you to consider the possibilities of alterations vary carefully before deciding to invest in entirely new kilns and equipment. Remember that, after all, the operator is more important than the kiln, and bend your efforts first toward securing a competent operator and then do what you can to provide him a good kiln.

Should Pay Profit

To sum up, then, good kiln drying requires first of all a kiln in which temperature and humidity can be varied and controlled and in which the circulation of air will give uniform drying results in all parts of the kiln. In addition the kiln should be provided with means for steaming the lumber. Having such a kiln to work with the operator should understand the principles of drying lumber and keep careful records of kiln operation; he should test the moisture in his stock and govern his drying conditions accordingly; he should test for casehardening and steam the stock when necessary to relieve casehardening; finally, he should bring his stock out of the kiln with moisture content evenly balanced and neither too high nor too low, free from casehardening and ready for use.

In this short talk on kiln drying, I have only been able to hit a few of the high spots and have had to purposely omit all but a mere mention of many important points. I realize fully that what I have said will probably not enable any of you to return to your plants to-morrow and start working out your drying problem without further information and assistance as to details. The most that I could hope to do in such a limited time was to outline to you the main requirements of good drying practice, with the hope that I might arouse your interest and curiosity to the point where you would want to follow the matter much further and find out the practical application of the general principles to your particular plant and problem. I can assure you that you will be well repaid for the time and effort required to study this subject thoroughly, and I shall be very glad to furnish any of you detailed information as to where you can obtain advice and assistance and reference material on the various phases of dry kiln design and operation.

1921 Will Reward Fighters

These are unusually strenuous times, not only in the millwork industry, but in all industries, and in my opinion we will never again see the time that millwork will sell itself without any effort on the part of the producer, says W. P. Flint, secretary of the Millwork Cost Information Bureau, in an address before the Southern Sash, Door and Millwork Manufacturers' Association. You had this bureau and your association as a guide during that frenzied period—neither of which failed—and most firms conducted their business in such a manner that a reserve was created, which will make it easier to finance a period of dull market conditions.

This does not mean that you should sit with your hands folded and wait for business to come to you, for we will never again see conditions as they were and it will be necessary for you to make an aggressive, intelligent selling campaign, if you wish your share of the business that is bound to come to the intelligent manufacturer. In this connection, I call your attention to the slogan of the Chicago Tribune—the world's greatest newspaper—which is being given wide publicity—"1921 will reward fighters." Gentlemen, this is great, and by fighters is not meant price cutters, or the selling of your product below cost.

Be fighters in 1921 and go after every prospect that you hear of. A cat is a waiter, as it is evidenced by the manner in which she sits at a hole waiting for a rat to appear. A fox terrier is a fighter and doesn't wait until he sees a rat to go after it. Just mention the word to him and see his ears prick up. Give him a smell of one and watch the dirt fly until he has a hole large enough in which to follow and secure his prize. Conduct your business, men, in the same way. Don't be a cat and wait for it to come to you, but be a fighting terrier and dig it out.

Now comes the important part. What good is any business you may secure if you do so at less than cost of production? None whatever. And the length of time you will survive is measured by the reserve that you have accumulated. Why do you consider it necessary to sell below cost? I don't think you do consider it necessary, as it has been proven by past experience that such a price does not create any new business. The next question you may naturally ask is: "What shall we do?" My reply is, "Fight and create business, but know your cost in fighting, as that is your most effective ammunition."

Relative Prices of Lumber and Other Building Material

Home-building is still retarded by high costs of labor and materials, and popular feeling is strong for reductions all along the line.

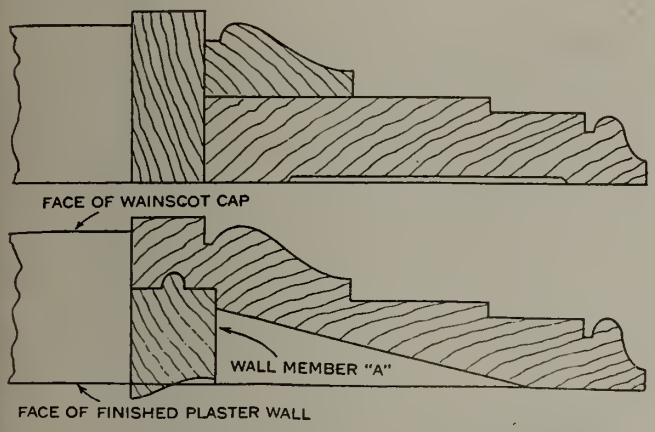
In any popular discussion of building costs, attention is naturally given first to lumber, as it is commonly thought that lumber is the heaviest item in the cost of frame buildings. People learn with surprise that the cost of labor runs to about seventy-five per cent. of the cost of building, and that the cost of plumbing is frequently more than the cost of lumber.

As compared with other building materials, lumber and structual steel have declined most from the prices of 1920, and the attention of the public should be called to this fact.—The Wood Box.

Suggestions for Planing Mill Operator

Economic Production of Special Design in Interior Trim—How One Firm Gets Out Special Order Frames—Separate Cutting Bill for Stock and Interior Trim

Often, in designing hardwood door trim for special jobs, an architect will call for heavy molding with large projection, or it may be necessary because of a projecting base or wainscot. Formerly it was built up in three or more members, as shown in the accompanying sketch. As the various members shrunk perhaps unequally, unsightly lines appeared, which



Economical method of running door trim.

marred the appearance of the trim. This has been overcome in many instances by running the trim in one piece as illustrated.

With one piece of wood across the face, the shrinkage is equal and there are no joints to show up badly; also, in fancy figured woods the grain presents a uniform figure across the face. It is also economical, as rippings can be used for the wall member A. By making wall member A as shown, the sharp edge will press directly into the plaster, thus concealing any unevenness in the plaster. Any one having seen open spaces between the back of trim and plaster will appreciate this advantage.

This method can be used for almost any profile of trim that may be designed. Generally 1-in. lumber can be used, although occasionally it may be necessary to use 1¼-in. material, if the moldings are very deeply cut. If only because of the time saved in setting up and running the material, this method commends itself to the progressive millman, and, where once tried, it is almost certain to be used again.

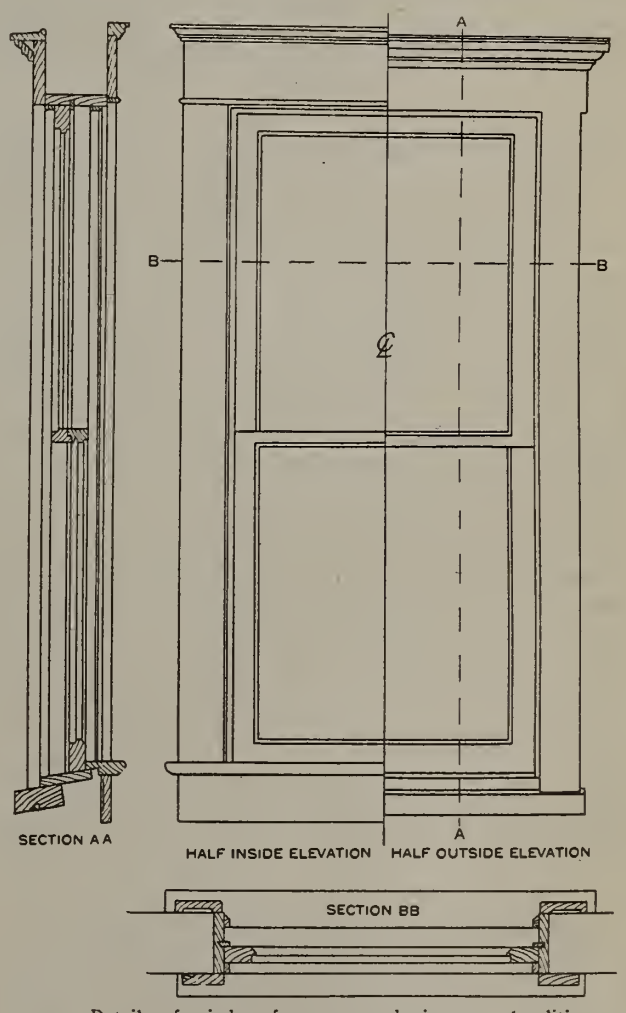
Another suggestion: We will assume that in the routine of business a planing mill receives an order for one skeleton plain-head window frame, 24x28 glass, 1⅜ sash, double-hung, 5¾ jamb and yellow pine finish inside. The sash size of such a frame is 2-ft. 5-in.x5-ft. 2-in., as our mill makes it—1 pair w. pine sash, 24x28 (2—5x5—2), 1⅜, 2-lts., check.

The order is written for the mill and two duplicate slips are made. The original slip goes to the mill, together with the cutting list for the frame. One duplicate goes into the file, and on the back of this card the time, lumber and other necessary data is noted, and the total cost recorded when the frame is finished. The third slip goes to the shipping clerk.

A duplicate slip is made of the cutting bill and given to the yardman, who sends the required stuff to the man who cuts the stock for frame, and the original slip goes to the cutter. After the stock is cut it is put through the sticker, then goes to the trimmer, who cuts all the stuff to its required size, cuts the dadoes and puts the pulley stiles through a machine which makes the mortises for pulleys and cuts the weight pockets. From the last-mentioned machine the stuff goes to the sander, thence to the frame-maker, who puts the pulleys into the pulley stiles and assembles the frame except that he leaves the tintel loose as it has been found that the lintel is easily torn off during the handling of the frame when being shipped.

The frame is now finished at the mill and is put into the warehouse. The benchman, having the frame completed, returns his slip to the foreman, who in turn puts it into the office. The clerk, after having received the time-card, figures up the entire cost in lumber, hardware and time, and thus the cost of the frame is established.

The inside finish required for this window frame



Details of window frame as made in many localities.

is not gotten out immediately, but is measured up later by the man who measures up all interior finish when he is notified that the millwork is ready to be measured up. The mill measurer takes the size of

the frame at the sash opening, thus—1 skeleton window frame, 2—5x5—2, Y. pine finish. After determining the style of trim required, which we will assume is 4¼-in. plain trim, 1⅛-in. stool and cabinet head, he enters an order in the mill for the trim as shown.

This finishes the window frame complete, as far as the planing mill is concerned. The second sketch

1 Piece W Pine 1¼ x 4¾ 3-2½ Sill
2 Pieces Y Pine ⅞ x 5¾ 5-8 Pulley Stiles Plow for 1⅜ Sash
1 Piece Y Pine ⅞ x 5¾ 2-7½ Head Plow for 1⅜ Sash
1 Piece W Pine 1⅛ x 5⅜ 2-7 Sub Sill
1 Piece W Pine 1⅛ x 5¾ 3-2½ Lintel S4S
2 Pieces W Pine 1⅛ x 3¾ 5-4½ Outside Casing S4S
1 Piece W Pine ⅞ x 2¼ 3-8 Hollow & Round
2 Pieces Y Pine ⅜ x ⅞ 5-4
1 Piece Y Pine ⅜ x ⅞ 2x6 Parting Beads
2 Pieces Y Pine ½ x 1⅛ 5-4
1 Piece Y Pine ½ x 1⅛ 2-7 Sash Stops

Cutting list of frame material.

1 Y Pine Stool 1⅛ x 3½ 3-5
2 Pieces Y Pine ⅞ x 4¼ 5x3
1 Piece Y Pine ⅞ x 4¼ 3-5 Trim and Apron
1 Piece Y Pine ⅞ x 5¾ 3-5 Cabinet Head S4S
1 Piece Y Pine ½ x 1⅛ 3-5 Bead
1 Piece Y Pinc 1⅜ x ?? Cap

How cutting bills are made out.

shows the construction of the frame as it is made in many mills, viz., a section on line AA of the outside elevation, a section on line BB, and half-inside and half-outside elevation.—The "Woodworker," Indianapolis.

Chappells, Limited, Acquire New Plant

Mention was made in a recent issue of the "Canadian Woodworker" of the fact that Chappell Bros. & Co., Limited, of Sydney, N.S., had taken over the Sydney plant of the Rhodes-Curry Co. or Truro, N.S. This has been accompanied by a reorganization of Chappell Bros. under the name of "Chappells, Limited," and an increase of capital stock from $50,000 tc half a million. The officials of the new organization are as follows: R. R. Chappell, president; M. R. Chappell, managing director and vice-president; Wm. Chappell, consulting engineer, and James H. Chappell and George A. Chappell, directors.

The purchase of the Rhodes-Curry plant is one of the largest transactions that has taken place in Cape Breton for some time. The deal includes all the real estate, plant and machinery with the exception of a quantity of contracting equipment. The acquisition of this property gives Chappell Ltd., an additional 150 feet of railway siding and more than double their warehouse and storage capacity. At the present time they are running both retail yards and when the volume of business warrants, will put the recently acquired plant in operation.

Chappells, Limited, do not look for any great change in prices during the coming season.

Orange Box Industry in Palestine

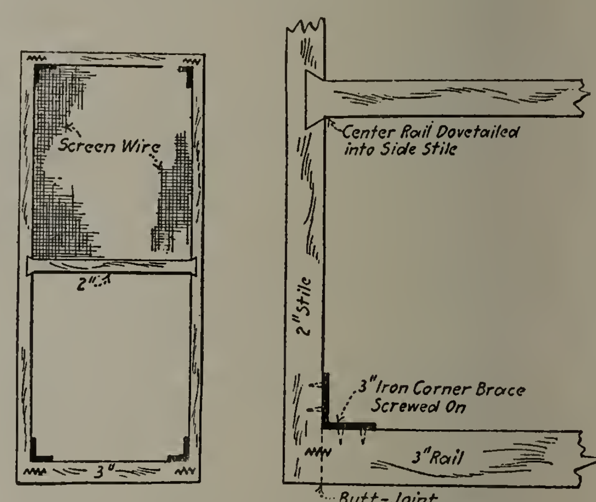
Orange boxes are made in Jerusalem of lumber imported from Roumania and Austria, but recently Norwegian and Swedish lumber has been used, says the United States Commerce Reports. Some of this material comes sawed to the sizes required, and some is sawed at Jaffa. The dimensions of the sawed boxes are as follows: length, 68 centimetres (26.77 inches); width, 32 centimetres (12.59 inches); height, 27 centimetres (10.62 inches). One partition is used. The thickness of the ends and partition is 16 millimetres (0.65 inch); thickness of the sides, 8 millimetres (0.314 inch); thickness of tops and bottoms, 7 millimetres (0.27 inch). The box itself weighs about 4½ kilogrammes (10 pounds), and its contents about 33 kilogrammes (72.75 pounds).

Since the Armistice the price of lumber has declined, and still greater reductions are expected, which restricts purchases to immediate requirements. The orange season in Palestine lasts from November to March, and contracts for lumber are made in the summer for delivery in August and September.

Make Screens During Slack Period

A reader of the Canadian Woodworker offers the suggestion that the making of full length window screens offers a profitable form of employment for shops that are finding things quiet. Old pieces of lumber may thus be turned into saleable articles and a certain amount of work provided.

The accompanying sketch shows a satisfactory type of screen which was made by the writer. The



Screen made with square butt joint.

stock is one and one-eighth material; thoroughly dry and seasoned. The centre rail is dovetailed into the stiles, making a strong joint. The corners are butt-jointed, using corrugated fasteners and wrought steel corner braces, instead of the usual mortise and tenon. This makes a supposedly better frame than when the mortise used for the wood is left full strength at its weakest point, the joint. The wire is tacked on in the usual manner, along the edge of the frame and covered with a half-round or suitable wood moulding. The most suitable form of hanger to use is those which are interchangeable with storm sash hangers.

Don't try to make enemies; they will make themselves without your help.

In business, as in other matters, to give is to gain; they gain most who serve best.

What Kind of Oak Do You Prefer?

Have You a Preference for Stock From Any One Section?—Does High-Land and Low-Land Oak Differ in Texture?—Read What Others Have to Say, Then Send in Your Opinion

There is more to buying lumber than specifying a certain suitable grade of stock and letting it go at that. Lumber from different sections and even different parts of the same district have varying characteristics which make such wood more or less desirable for certain specific purposes. This might be illustrated by considering the case of oak lumber.

Some reader may say "Humph! Oak is oak." So it is, but oak from Virginia differs in quality, texture, strength and grain from oak grown in Arkansas, for instance. For certain work on certain articles, one might be preferable while for some other equally important purpose the other wood might be considered more advantageous. Another point is that the state or section in which the oak grows is not the sole controlling factor for lumber from the same section, only cut from high or low land varies in its several qualities.

As a general rule we may take it that wood growing in the warmer, milder climate of the south, is softer in texture and possibly more even and finer in grain, than that grown in the more rugged northern climate. Again, as suggested above, timber from high land is harder in grain and texture than that from low lands.

A number of furniture men were asked by the "Canadian Woodworker" if they made any distinction between oak from various sections, and to outline their experience with stock from different localities. The following replies should prove of interest and value to all wood users: One western Ontario manufacturer states that in our plant, in which we make dining and chamber furniture, we prefer oak of soft texture, which grows in West Virginia on high land, but for chair work a much harder texture is preferred, for the reason that soft wood is not of sufficient strength for frail parts. There are many localities in the States where soft wood is procurable, and the geographical location does not make all the difference. It depends largely whether the timber grows on high or low land. The low land oak is always of hard texture and character, and this is what the waggon-makers prefer on account of its great strength, but if we were to finish this on our fine furniture, the result would not be pleasing, as the stain will not penetrate evenly and it is only suitable for painting.

The soft oak has a large open pore, and the soft parts will absorb the finishing material, and the flakes will remain bright, forming a golden cast between the two which, as already stated, cannot be obtained in hard oak. The soft wood is very much easier handled. It takes less time to dry, and then again, saws and knives cut it with greater ease, saving power and so forth. We could enumerate many other objections, but we trust with the information given you, that some of your readers may be guided when purchasing oak in the future.

Another well-known furniture man says: We have used oak from different states—Mississippi, Missouri, Arkansas, Louisiana, Kentucky and West Virginia. We find the latter the most suitable for our purpose for the following reasons: It is of an even texture—uniform color—and considerably softer than what we have had from other states. The last five years we have practically had no other oak than that grown in West Virginia..

Other opinions submitted are as follows:

"We are not large users of oak, but we prefer to secure oak from Virginia and that vicinity, rather than the stock grown further south, or here in the north. We like it because it is softer and we think takes a nicer finish. It is decidedly easier on our equipment throughout the factory and nicer to handle."

"Our experience with quartered oak has been limited almost exclusively to Indiana and Kentucky stock. For golden oak, the soft textured wood shows to much better advantage, and is of a more even color. While it costs considerably more at certain times, we think the extra quality makes it well worth the difference.

"For fumed oak, with care in selecting, the southern woods are good, but the extra time selecting takes away some of the advantage of the difference in price. For this reason we always buy the northern grown stock."

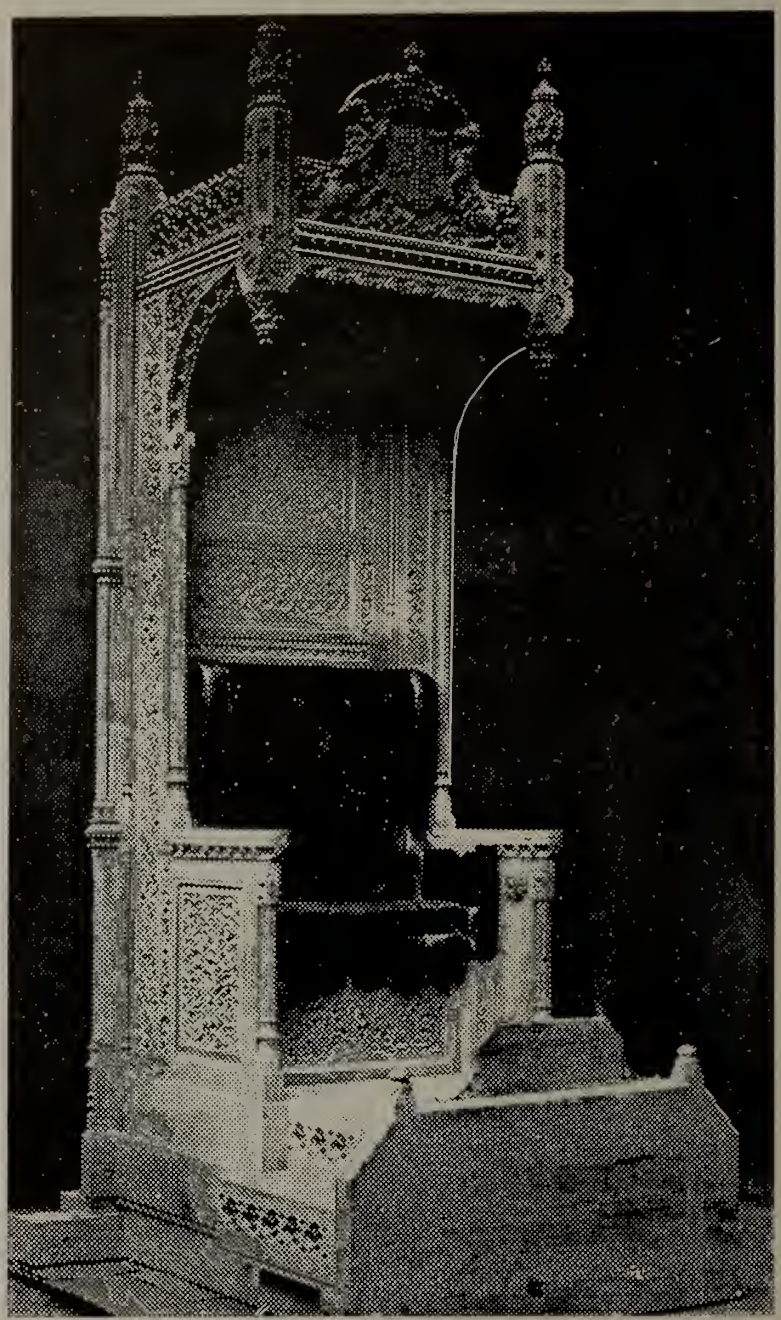
'We have had only little experience with American oak. The only kind of oak we have been manufacturing is plain red oak. However, we prefer to have eastern "grown stock," as it will machine to better advantage. We also find that this stock has a closer grain than the Southern oak, thus giving smoother and more uniform finish."

Important Gathering to Discuss Costs

All woodworkers, who are interested in costs, are invited to attend the seventh annual meeting of the Millwork Cost Information Bureau to be held in Chicago, Wednesday, April 27th, 1921. A very instructive and interesting programme has been prepared. This gathering offers an opportunity to secure first-hand information pertaining to the cost and estimating problems encountered in the woodworking industry. Cost systems that are giving every-day service in various plants will be described and analyzed; the weak points brought out and improvements suggested. In issuing this invitation, which is extended to non-members as well as members of the association, the secretary, W. P. Flint, states that "you will not be called upon to digest a mass of ideas that are practical in another industry and not in yours, but only such information that is actually in every-day use in the millwork line."

This organization enjoys a membership extending into Canada. Among the Canadian members are found the following firms:—

R. Laidlaw Lumber Co., Ltd., Toronto, Ont.
Henry Morgan & Co., Ltd., Montreal, P.Q.
Wm. Rutherford & Sons Co., Ltd., Montreal, P.Q.
P. W. Gardiner & Son, Galt, Ont.
Midland Wood Products, Ltd., Midland, Ont.
Midland Woodworkers, Ltd., Midland, Ont.
J. R. Eaton & Sons, Ltd., Orillia, Ont.
The Laberge Lbr. Co., Sudbury, Ont.
Radford-Wright Co., Ltd., Winnipeg, Man.
Moose Jaw Millwork Co., Ltd., Moose Jaw, Sask.
Regina Sash & Door Co., Ltd., Regina, Sask.
Western Mfg. Co., Ltd., Regina, Sask.



Replica of Speaker's chair in British House of Commons.

New Speaker's Chair for Ottawa

The Speaker's chair at Westminster is famous for its artistic beauty and dignity in design. It is considered to be a perfect specimen of Gothic architecture. In the replica for the parliamentary buildings, Ottawa, the original chair has been carefully reproduced. Many photographs, plaster casts and other accurate details have been taken and faithfully followed. The foliated canopy, the intricate carvings and mouldings, and the graceful pinnacles and pendants, are some of the finest examples of the carver's art. The royal arms which surmount the canopy are carved from the old oaken beams from the roof of Westminster Hall. The back of the chair contains many delicately worked linen-fold panels, each with the monogram "V.R." and the wreath and inter-twined cord. On the folded ribbon, amidst the ornate carving on the right side of the chair is inscribed "Manus justa nardus memor et fidelis mens conscia recti," and on the reverse jamb, "Nec prece nec pretio libertas in legibus hostis honori invidia laus deo." (The hand that deals justly is a sweet smelling ointment. A heedful and faithful mind is conscious of righteousness.—(Justice is influenced) neither by entreaties nor gifts. Liberty lies in the laws. Envy is the enemy of honor. Praise be to God.) The chair, which has a total height of 13 feet 6 inches, is a gift to Canada from the members of the United Kingdom branch of the Empire Parliamentary Association. The replica has been executed by Messrs. Harry Hems & Sons, Exeter, under the direction of H. M. office of works.

Situation Calls For Close Co-operation

Box Men Put Their Business on Sound Basis—Hampered by Excessive Freights—Wages Must be Considered—Greater Efficiency Required

By B. F. Masters, Chairman, Board of Governors*

When we met a year ago at our annual meeting our industry and the business industries of the country were at about the peak of prosperity. Our factories were all running at full capacity, there was a splendid demand for our product, and I presume that all of us were very agreeably pleased with the results of our business for the preceding year, and the prospects at that time were very splendid for a continuation of, you might say, abnormal business, because the business conditions that existed a year ago were a little bit abnormal. We called them normal because they were about up to the capacity we reached during the war when we all went a little better than a normal condition to meet the exigencies of that occasion.

At our last meeting, which was in October, we perhaps did not realize the situation we were facing at that time and which has since developed. We were not competing much at that time. We were still running along on a fairly even basis of production and of demand, and prices were being maintained, so that our product was being manufactured and sold at a profit. We are here to-day under a condition that marks perhaps the most extreme and most divergent view and condition of previous meetings that has ever existed at any meeting of this association.

Box Industry Not Alone

Our business is not the only one that is affected by the depression through which we are passing, or at least of which we are in the midst. I hope we are passing through it. Some people even predict that we have reached the bottom of the depression and deflation. That is a question that may be argued pro and con. I wish I could bring you some message on that subject. I can't. I don't think any of us know very much more than the rest of us, but it is notably true that some lines of industry have not been deflated, if I may use that word, or liquidated to the extent that our industry has. There may be some industries in which this deflation or depression has been equally or more pronounced, but my personal view of the situation is that we cannot have stability in business until all the basic commodities have been deflated or liquidated on a comparative basis. I doubt if there is a manufacturer here to-day who would be willing to see the present depression in the lumber and box industries continued and have it stabilized on the present basis without a like deflation in some other industries with which we come in contact. It is my opinion, for what it may be worth, that we will not have complete stability in the various lines of trade, and complete confidence in the minds of the buying public and in the business men of the country, the financial interests and all others that combine to produce a demand for business, until this deflation is general.

Without mentioning the lines in which deflation has not been complete, the most notable example and perhaps the key to the industrial situation to-day is the railroad situation and with the excessively high freight rates that prevail to-day, and when I say excessively high freight rates I do not mean that the railroad companies are receiving very much more freight than is necessary to pay the enormous wages and other elements of service that they are obliged to pay under the present rules and regulations, but with transportation standing as it is to-day and with the part it plays in our commercial enterprises and in our business, it is not reasonable to believe that our industry or any other industry can be stabilized upon a rock bottom basis, that your prices can be brought down to the irreducible minimum, until freight and transportation charges have also been brought down to a comparative level.

Readjustment in Wages Must Come

The great problem of to-day seems to be between labor and capital and seems to be which should take the first step in reducing the cost of production. There are many industries, particularly in large centres, in which union labor prevails, where wages have not receded to any extent whatever, for I think I am safe in saying that there are not over three or four labor unions in Chicago that have reduced their wages over the high peak that was paid during the most exciting days of the war. This is not so nearly true in the smaller centers nor is it true to as great an extent in sections where union labor does not dominate. Our railroads are manned from bottom to the top, clear down the line, with union labor, and the Federation of Labor has declared itself very positively against any reduction in wages. The railroad companies are not buying, as we all know, probably for the reason that they fear they cannot afford to buy. They are seeking the privilege, as you know, of making new contracts with their employees. This attempt is being combatted by the employees because they say before wages are reduced capital must reduce its income and must reduce its rates, bankers and financiers and capitalists and manufacturers; in other words, capital must reduce the level of its prices in some way that will bring down the cost of living before wages are reduced. It is a thrice-told tale and we all perhaps have our notions about it. I don't suppose any of us feel that we want to burden labor with the responsibility of bringing the commodities down on a pre-war level without sharing in the reduction in the cost of living, but it must be admitted that the cost of living is being reduced gradually, in many lines to quite an extent, and still one outstanding argument against the reduction of wages, particularly in the large cities, is the excessive rents that are being charged. Chicago, perhaps stands foremost in that situation. There are some statistics given out this morning that indicate the scarcity of homes in general is not so great as we have been led to believe, but the impression has prevailed here that there are not enough homes in Chicago for Chicago's citizens, and consequently those who have homes have been putting rents upon a basis that has entirely precluded the possibility of any reduction in wages to the laboring man. So that we have the conflicting conditions, the employer on one side, expecting a reduction in wages, and faced with the necessity of reducing the cost of his product, what-

*Address, National Association Box Manufacturers, Chicago, Ill.

ever he may manufacture himself, and labor, on the other hand, confronted with the necessity of providing food and clothing for themselves and their families.

Selling at or Below Cost

It is difficult to foresee what the present tendency may lead to. The tendency of prices at which products are sold has declined very much more rapidly than the cost of production. I daresay that I voice the experience of every man in this room when I say that the reduction in the selling price of your product is in no way analogous to the reduction in your cost. I have heard it said that selling prices in some instances have been reduced fifty per cent. If that be true, it may be possible that the prices that have suffered this great decline were a little higher than they need to have been; though I have yet to find anybody in the box business who could be charged with profiteering, but it may be that some of us had greater profits than others and greater than might be justified, but I am sure it is true that the cost of production has not in any measure declined with the cut in selling price brought on by competition and by the general sentiment of the buying public that everything must be cheaper. When a manufacturing industry, when a user of boxes, a consumer of boxes, a shipper, is confronted with the necessity of reducing the price of his product about the first thing he looks to is a reduction in the cost of his package. I have studied the situation to some extent and I have observed the experience, the tendency in this direction, and I believe it is quite generally true that the cost of the package is one of the first things that a shipper endeavors to reduce in order to get the cost of his product down.

Primarily the cost of a shipping container is an expense item. Everything else that goes into a manufactured product is no doubt figured as a part of the basic or elemental cost of that product and some provision is made by all manufacturers in various lines for that, but the average shipper rather lumps the cost of his package. There may be exceptions to that, but they look upon it as an item of overhead, not an element that enters the constructive cost but just that general term overhead that applies to all the evils of every business, and I suppose the box business is burdened to it to a greater extent than almost any other industries our hopes for the future are all overhead.

Values Should Not Be Sacrificed

Therefore, you find a tendency to reduce the cost of packages accentuated more than any other product, and we are the very first industry, perhaps, to be confronted with this demand. The result has been that we are about the first industry to yield. Notwithstanding the National Association and the various local associations and the various attempts that have been made to stabilize our product, I know of no industry that is more easily led aside from recognition of the cost of our product than the business that we are all engaged in. You always find somebody who is willing to sell his product at the buyer's price, at what the buyer tells him his competitor will furnish it for. I am not saying this critically, and if it be true, it perhaps applies to me as much as to any of you gentlemen, but that is the tendency and we must recognize it, a tendency to disregard costs and sell our goods at whatever price we can get, an attempt to reduce our stock of raw material, an attempt to keep our factories operating by making a price that we know will lose us money. Ordinarily such a theory or such a condition should be discouraged, and is ridiculous in a way, but we have been passing through a period that has been ridiculous, if I may use the word, it has at least been extreme, and we are obliged to do many things which, taken separately and apart, might seem foolish or ridiculous but which when considered in connection with the whole may, after all, be reasonable.

(Continued in May issue)

Hemlock Suitable For Butter Boxes

A test to determine the suitability of various kinds of wood for butter containers, made by the Dairy Division, Department of Agriculture, Washington, D.C., showed that hemlock may be used for butter containers without imparting to the butter sufficient woody flavor to be commercially objectionable.

The butter used in the test was made from unripened, pasteurized sweet cream. Four boxes each of all kinds of wood were used. These boxes contained about two pounds of butter. One of each was paraffined. All were lined with parchment paper. The boxes were placed in a refrigerator and a temperature varying from 34 to 40 degrees Fahrenheit maintained for ten days. The boxes were then removed and the surface examined for woody flavors. The judges were M. A. A. Sonderguard, G. R. Campbell, C. E. Newlander, William White, all of the Dairy Division, and R. K. Helpehnstine, of the forest service. "Our tentative conclusions," they reported, "are that hemlock, cypress and Sitka spruce may be used for butter containers without imparting to the butter sufficient woody flavor to be commercially objectionable."

Butter packages used by the trade are white ash tubs, white spruce tubs, yellow poplar boxes and to a small extent birch boxes.

A summary of the comments by the judges follows:

"Yellow poplar, paraffined, degrees of woody flavor very slight, not commercially objectionable but more pronounced than the white spruce and red gum; unparaffined, flavor little greater than on paraffined. Probably not commercially objectionable.

"White ash, paraffined, flavor very slight; not commercially objectionable. Unparaffined, very slight, not commercially objectionable.

"Hemlock, paraffined, very slight, not commercially objectionable. Unparaffined, greater than the paraffined, similar to unparaffined yellow poplar.

"Yellow pine, paraffined, same degree as yellow poplar unparaffined. Unparaffined, medium.

"Cypress, paraffined, flavor very slight, same as in red gum. Unparaffined, very strong, but not as bad as western yellow pine.

"Red gum, paraffined, none. Unparaffined, very slight but slightly stronger than white spruce.

"White pine, paraffined, medium. Unparaffined, medium.

"Cottonwood, paraffined, none. Unparaffined, very slight and not enough to be commercially objectionable.

"White spruce, paraffined, none. Unparaffined, very slight and not commercially objectionable."

Open belts without any guard around them should be considered as death traps. Do not wait until the factory inspector warns you. See that neither you nor your workpeople run the risk of being caught by a quickly-moving belt.

Greatest Strength Element in Boxes

Increase in Number of Nails Makes Stronger Container—Boxes Designed for Ease in Handling—Other Points to Consider

NAILS

ACTUAL TESTS ON APPLE BOXES SHOW:

5 nails per nailing edge withstand 50% more than 4 nails

6 nails per nailing edge withstand 100% more than 4 nails

Poor nailing has cost you money in the past
Good nailing can save you money in the future

YOU CAN'T AFFORD NOT TO NAIL BETTER

8 nails more per 100 boxes costs 15c

16 nails more per 100 boxes costs 30c

THE BEST APPLE CONTAINER

A Dry, Pine Box Properly Nailed

BOX BUREAU

Western Pine Manufacturers' Association

Leaflet by Western Pine Manufacturers' Association which members are using with correspondence and inserting with shipments of shooks.

When it is realized that the packing and crating business used up about one-eighth of all the timber cut in the United States last year we begin to realize what a factor boxing and crating is in our national business. It took 4,500,000,000 board feet in 1918, which is five times as much as was used by all American furniture makers and 25 times as much as the shipbuilders. It used practically every kind of wood from yellow pine, white pine and Douglas fir, the three leaders, down through gum, poplar, birch, maple, hickory and the rest to 524,000 feet of cucumber (of the magnolia, not vegetable variety), 170,000 feet of cherry, 13,000 feet of mahogany and 3,500 feet of yucca.

When a single American company spends $14,000,000 for wood to be used in packing and crating only, not to mention the cost of the millions of nails, the 700 miles of iron strap, 20,000,000 square feet of wrapping paper, water-proof cloth, together with screening, string, screws, anti-rust compound and all the other material necessary to proper packing of goods for shipments, it is evident that packing is a subject that industry must study closely for flaws and waste.

The fact that many a manufacturer is doing so is evidenced from the number of organizations which have adopted standard sizes and shapes of boxes, standard ways of putting goods into those boxes so that the centres of gravity shall be so located that the box will "handle" with the greatest ease and ride with the least danger to the contents.

Nowadays a box isn't just made. It is a carefully designed container, over whose corner construction and relative strength of pieces and spacings between nails, some engineer has labored long. The laboratory idea in box testing is fostered by the United States Forest Products Laboratory at Madison, Wis., where annually thousands of boxes and cases full of goods are strained and squeezed and dropped and tumbled mercilessly in huge "squirrel cage" testing drums so that experts can watch them slowly go to smash, noting exactly how and why and where.

Greatest Strength in Nailing

The testing laboratories have discovered, for instance, that the greatest strength element in the average container is in the nailing, rather than the thickness of its wood, though naturally the end pieces of any box must be strong. They have shown that about 98 per cent. of the shippers of the country do not use enough nails of the right sort driven at the right angle. The American Society for Testing Materials, at its recent convention, lined up with the Forest Products Laboratory favoring more nails.

A standard plan for nailing up a box was worked out thus: In domestic boxes for 6-penny nails or smaller, the spacing when driven into side grain of the end of a box should be 2 inches apart and when driven into end grain, 1¾. This spacing should increase ¼ of an inch for each larger penny. In export boxes, nails should be ½ inch closer.

And any old kind of a nail will not do your scientific packer. Small heads will pull through wood. If the head is a shade too thin it breaks. Smooth or even barbed nails will not stand the strain which cement-coated nails endure. A thick nail a trifle short pulls loose. A long, slim nail will break between the boards with the weaving of the box and so on. The nails must be right and driven correctly, else the box might about as well be tied up with string.

Box Material Must be Carefully Handled

Important as is nailing, it is also essential that the lumber in a box be properly treated before it goes into use. The matters of moisture content and time of storage before use are vital. Moreover, every land must be studied carefully and the packing made to fit the country. For instance, goods going to the West Coast of South America must be in smaller units than those going to the East Coast because of the poorer facilities and fewer railroads of the west side. Landing goods at Chilean ports mean taking them off in lighters and if those goods happen to be electrical machinery going up into the mountains, they must be in small enough packages so as to be easily transferred into the lighter without banging through the bottom if a lighter happens to be rising and falling with the sea, and they must not exceed 170-pound units for burros or 350 pounds for mules if they are to be toted into the hills.

Furthermore, the shipments must withstand all sorts of weather travelling from temperate New York, let us say, down across the humid sweltering Carribbean Sea, through the Panama Canal and the salt spray of a Chilean beach, up into the snows of Andean Peaks, with perhaps a few weeks of exposure to the

wind and rain lying somewhere in the open, before it is unpacked.

Careful studies of packing of products have reduced the cubical contents of shipments to an extent which not only cuts freight charges materially, enabling a shipper to sell more advantageously in foreign lands, but often saves cargo space for the other fellow's use. Proper packing also aids in combating theivery. If a case is held by cement-coated nails, its strength is increased at least 100 per cent, and if the ends of wire or steel bands are sealed by the most approved methods, then a pilferer has a discouraging job of opening a case and closing it again without leaving traces.

Savings Indicated by Laboratory Tests

Freight, Cost and Safety Conserved by Scientific Investigation of Boxes Made of Different Thicknesses of Lumber and of Various Types of Construction—Results of One Series of Tests

Not every plant manager who uses boxes nor every manufacturer of boxes is a convert to the practical application of laboratory tests to box problems, and that is the man who should read this report.

Some recent laboratory tests indicate the extent to which savings can be effected in the average shipping room by application of practical laboratory tests. Very rarely is any investigation made which does not show a considerable saving over the packing and shipping methods in general use by the company.

The report as given below is one taken at random from many tests, and demonstrates very definitely just what can be done.

Thirty boxes, all of the same dimensions, viz., 12⅝ in. x 12⅝ in. x 9¾ in. (inside measurements) were tested. The ends of all boxes were alike, being made of 13/16 in. Western white pine, with cleats 13/16 in. x 2 in.; the object of these tests being to determine the effect on the box strength of varying the thickness of sides, top and bottom. (All sides, tops and bottoms made of Western white pine). The boxes were divided into six groups, as follows:

Five were of 13/16 in. material.
Five were of ⅝ in. material.
Five were of ½ in. material.
Five were of ⅜ in. material.
Five were of 5/16 in. material.
Five were of ¼ in. material.

The size and number of nails used in all boxes, as well as the contents, were identical. These boxes were tested in a revolving drum, each box being tested separately and removed only after it was broken and the contents were no longer protected.

The results, as shown by these tests, indicates the average number of drops to break the different sizes.

13/16" boxes stood 112 drops equalling 100%
⅝" boxes stood 253 drops equalling 223%
½" boxes stood 187 drops equalling 167%
⅜" boxes stood 32 drops equalling 28%
5/16" boxes stood 21 drops equalling 19%
¼" boxes stood 20 drops equalling 18%

Granting that the users havet obtained perfect satisfaction from a 13/16 in. box, it is obvious from the foregoing data that the material in sides, tops and bottoms could be cut to ½ in. thickness, instead of 13/16 in., and yet the strength of the box would have been 167% as against 100%. However, if the material used in the sides, tops and bottoms had been cut to ⅜ in. in thickness, the box would have been absolutely out of the question and weakened beyond practicability.

After this series of tests had been completed, similar boxes were tested with one metal strap around the centre. These tests show the following results:

13/16" without straps 112 drops or 100%
½" with one strap 936 drops or 835%
⅜" with one strap 323 drops or 288%
5/16" with one strap 121 drops or 108%

The latter tests indicate that the box could have been still further lightened, as shown by the first tests, and that by the simple addition of one strap, using 5/16 in. thickness sides, top and bottom, would have resulted in a stronger box than the heavy 13/16 in. material provided.

Getting down to dollars and cents in the matter, using lumber values effective at the time the tests were made, the 13/16 in. box would have cost approximately 55c, while the box of ½ in. material would have cost approximately 40c, a saving of approximately 25%. In weight, the difference amounts to 3¾ pounds, which, taking into account an average freight rate for any commodity of $1.00, means a saving in freight of 3¾c additional. In other words, a total saving in this instance, resulting from application of scientific box tests, was approximately 18¾c.

So many factors, such as species of lumber used, size of box, weight and shape of contents, also the varying conditions of transportation, and the methods of packing and storage have a bearing on the subject that only a trained box engineer can be safely charged with the designing and the specifying of box construction. —"Boxes."

Million Boxes Without Serious Accident

If they had spread their lumber out on the surface of the ground, plank by plank, they would have had a board walk more than 1,500 miles long. But they didn't do that—they took more than 8,000,000 feet of lumber and made a million and a half boxes and nearly 87,000 barrels out of it. What is more, they did it all without a single lost time accident in eleven months of work.

This noteworthy record was made by the box factory department of the Swift & Company plant at the Union Stock Yards at South St. Paul, Minn. The following figures for the period from February 1 to December 31, 1920, speak for themselves.

Average No. of men employed	125
Lost time due to accidents	0
Boxes manufactured	1,591,243
Barrels manufactured	86,779
Lumber used	8,243,761 feet
Nails used	6,831 kegs

In the corresponding period of 1919 this department had 49 lost time accidents.

Machinery & Equipment

Yates Edge Sander

There are many different kinds of sanders, each designed for a special purpose or particular class of work. The one shown in the accompanying illustration is an edge sander, the product of the P. B. Yates Machine Co., Limited, Hamilton, Ont. This machine is of rigid construction, having a heavy cast-in-one piece base. It is fitted with two adjustable tables, a front and an end table. The front table can be dropped to form an angle not exceeding 30°. The sand drums are 10 in. x 14 in. and 10½ in. x 4 in. and carry a 10 in. sand bolt. Oscillation is needed in order to procure a fine, even finish; removing the ridges and scratches which would otherwise appear when the belt is run straight, without the employment of oscillation. This is secured by the employment of an eccentric and the locomotive link principle. Coil springs surrounding the driven spindle absorb the shock incident to change of direction and a smooth, easy oscillation is the result. Ball bearings are placed so as to prevent excessive friction. A tightener or idler is attached to the rear of the machine to maintain a suitable tension on the belt. This is locked in position by a handled set screw. Just back of the front table is a perpendicular back to support the sand belt when work is pressed against it. By means of a hand screw this back can be adjusted to accommodate the work. The drive pulleys are placed in the base, thus economizing in floor space, yet they are readily accessible, if necessary. Special drums and forms can be had with which to sand special patterns and designs.

Among the indigenous industries that are now having a boom is that of basket making by Indians along the Mission River, B.C. The baskets are made from the wood of the mountain ash tree, which is split and then pounded out until thin strips are obtained, about the width and thickness of tape, from which the Indian women weave extremely beautiful basket ware.

Pulley with Interchangeable Rim

A new split pulley is described in an interesting catalog received from the Canadian S K F Co. Toronto. This new pulley, which is of metal, has several features which should commend it to practical men. One of the most radical departures from ordinary design is that both the bushings and rims are interchangeable. A standard cast-iron spider, in various diameters, has been adopted, and rims and bushing may be secured to suit the shaft and belting. The rims are made of steel, of a quality to withstand a high tensile strength and the ends are flanged to receive the stretching bolts. When the rim is securely

New Yates S. 2 edge sander.

attached to the spider the latter is under compression, permitting the pulley to be run at an unusually high speed. The pulleys are carefully balanced and their use should tend to reduce vibration in shaft or machine. No keys are required, the spider, with bushings inserted, being firmly attached to the shaft, and then the balance weight and rim added. The rims run from 3 to 16 inches in width and being interchangeable, if for any reason the width of the face of the pulley is not suitable, a new rim may be attached without removing spider or buying a new pulley.

Efficient Vertical Router

The new type of vertical router is shown in the accompanying illustration. This machine was designed as a piece of production equipment for automobile, aeroplane and furniture-manufacturing plants. It is made with or without the floating table and may be had for either belt or motor drive. All the bearings are ball bearing and the machine is massive and powerful, containing all the refinements needed for intensive quantity production. The vertical adjustment of the table is 8 in., while the cutter has a vertical movement which is adjustable from 0 to 2½ in. The spindle is capable of swinging a cutter 6 in. in diameter. The distance from centre of spindle to base of column is 27 in.

Three-Ply Construction in Motor Car

A new motor car is being introduced by the Parenti Motors Corporation of Buffalo, N.Y. The chief innovation in this car is that the body is constructed of plywood and that the wheels have plywood discs instead of spokes. This construction results in a very light car and permits of some startling changes in design to be made. In this particular car the chassis is combined with the body and each wheel is supported by a cantilever spring, doing away with both front and rear axles.

A cheap coal is not one which gives you quantity for a certain sum of money, but which will surrender the greatest amount of heat.

Machines are now being made with every moving part having ball bearings.

New type vertical router.

Upholstering and Trimming

Working Covering to Best Advantage

Many Problems Presented in Cutting Upholstering Material—Proper Planning will Conserve Cloth—Wide Variation in Designs

For the planning and cutting of upholstery materials a cutting board is necessary. Its dimensions should be adapted to the amount of space available, but it should not be less than 7 ft. long by 4 ft. 6 in. wide. The top should be of hardwood to stand the continual hammerings of the pritchawl occasioned by the marking out of various materials. The upholstery cutter needs but few tools. The chief of these is the shears, which should be a well-made pair of French pattern, slightly larger than those used by the upholsterer. Hammer, yard stick, tape measure, pritchawl, straight edge, a large square, French chalks of various colors, blue pencil, and pins, complete the list. An upholsterer cannot be regarded as a master of his craft unless he is able to plan and cut covering materials. says Frederick Palmer in "Practical Upholstering." In large factories where much repetition work is done the learner has little opportunity of gaining experience in measuring and cutting, and may even attain the status of a journeyman without much knowledge of this side of his craft.

Upholstery fabrics are, as a rule, expensive, and to use a piece of material 3 yards in length when by skilful cutting 2¾ yards would suffice, makes a considerable difference in cost. Even when an exact estimate of the yardage of material required has been obtained, waste may occur on account of incorrect planning.

Pattern Should Be Studied

Much depends on the material, a small conventional spot pattern being easier to plan and cut than a bolder design with a large medallion centre or evenly-balanced floral motif which makes it necessary for each cut to be treated with due regard to the nature of the pattern. Figured fabrics are more wasteful in cutting than plain or self-colored materials, because the pattern requires matching. Centre patterns on some designs are repeated at inconvenient distances so that waste is unavoidable. Much practice is necessary to become a skilled cutter, and it is a safe rule to plan out the various pieces carefully before commencing to cut, but as has been pointed out, plain materials, small powdered or spot patterns, require less planning than floral or figured fabrics.

If the upholsterer starts to cut before planning, failure is usually the result, and to this must be added waste of time and unnecessary seaming. Before making calculations the cutter must be conversant with the width of the material he is using, as accurate quantities and estimates cannot be given unless the width of the material to be used is known.

Various upholstery fabrics are now generally made in definite widths, and in specifying cretonne (single or double width), tapestry, velvet moquette or brocade it would hardly be necessary to detail the exact number of inches in the width. Fabrics for upholstery are now woven in a convenient size for cutting, and vary from 48 in. to 52 in. wide. Velvets are largely used, and the inconvenient 24 in. width has become old-fashioned. Single width cretonne generally measures 30 in. wide, while double width cretonne is woven the same width as tapestry. Moquettes, brocades, silks, damasks and various kinds of artificial leather are all made in widths to suit the convenience of the upholsterer. Corduroys follow cretonne as regards width, both single and double, and there are numerous other materials obtainable in tapestry widths. It should be noted that a double width material usually cuts up more economically than single width.

Keep Down Number of Seams

Seams constitute a bugbear both to the upholsterer and customer if they are too numerous or placed in such positions as to offend the eye, and seams which are objectionable in appearance or indiscriminately placed give rise to many complaints. The aim of the cutter, therefore, should be to reduce the number of seams to a minimum. In some materials the joins show very distinctly, while in others they are scarcely visible. In patterned fabrics of small set design or foliage the joins are not so conspicuous as in those where the fabric is plain. Velvets need great care in planning, especially self-colored weaves. Moquettes also present difficulties, as they are of a stiffer nature than velvet, and unless the join is to some extent hidden by the pattern, it is difficult to prevent a clumsy appearance however carefully they are sewn and pressed. In stuff-over work seams are unavoidable, but the skill of the cutter lies in so planning the work that they are neither numerous nor conspicuous.

An insufficient quantity of material is the general cause of too many seams; a lesser quantity may suffice, though this economy is practised to the ultimate detriment of the work and at the risk of complaints from customers, while the upholsterer himself is hampered through a lack of pieces for joining and making up. It is true that the fabric for covering a piece of upholstery is a most expensive item, and economy is necessary; but it is folly when finishing the work to spoil its appearance by not allowing enough material. Another argument against undue economy as regards material is that it causes tight coverings which, from the upholsterers point of view, are difficult to deal with and require much skill and care in planning out; this means that additional time is required, and when the work has to be finished in a given number of hours, the period set apart for the actual covering of the piece is curtailed, to the detriment of this most essential process. Seams are not so prominent when they are matched, and the skilful upholsterer can take advantage of the pattern to hide the seams or camouflage them—to use a modern word. In high-class work the joins are always matched, and the quantity of material allowed is governed by the pattern. The length of a repeat in a patterned material may vary from a few inches to about a yard, and it is frequently a matter of great difficulty to obtain matches for all

parts of the work. In such cases the inside of the work should be studied first where the seams to be matched are more conspicuous than those on the outside.

Medallion and Foliage Designs

To attempt cutting haphazard on such fabrics as medallion or foliage designs would be to ask for disaster. A medallion design to be used to advantage and with the best effect must be carefully planned before cutting. The positions which the medallions will ultimately occupy are important and best obtained while the work is on the floor level. In an ordinary divan a medallion would be necessary for the centre of the back, another for the seat, and two more for the arms.

A foliage pattern, and is one that, generally speaking, allows the cutter plenty of liberty. The design being of an all-over character, the failure to match exactly is not so apparent. Foliage designs are economical in cutting, but more suitable in style for massive, heavy stuffovers than for light, graceful work.

(Continued in May issue)

Discuss Sales Tax

Mark Rowe of the Canada Furniture Manufacturers, Limited, Woodstock, Ont., and Wm. Cawkell, secretary of the Furniture Manufacturers' Association, Toronto, represented the furniture industry at a joint meeting of representatives of the Canadian Manufacturers' Association, the Retail Merchants' Association and the Canadian Credit Men's Trust Association, which was held in Toronto on March 30th and 31st, to discuss the present and proposed methods of Dominion Government taxation; to define the words "manufacturer," "wholesaler" and "retailer," and to study the Made-in-Canada Campaign.

The question of Dominion Government taxation and the definition of the different terms were thoroughly discussed, many of the better-known business men and manufacturers offering their views. The following proposals were brought in and unanimously adopted by those present: (11 That the business profits war tax act shall not be re-enacted; (2) That the income war tax act, affecting corporations shall be repealed; (3) That the present excise manufacturing tax on confectionery shall be abolished; (4) That the present sales tax be adjusted so as to provide the additional revenue needed by the Dominion Government.

As a suggestion to the Finance Minister, the following definitions of gradations of trade were endorsed:—

"Manufacturers"—Persons, firms or corporations who produce, manufacture, process or assemble articles or materials into saleable articles or materials for sale. (This it was pointed out would not interfer with an appeal for exemption from merchant tailors, milliners and others engaged in lines of a like nature.)

"Wholesalers" — For the purpose of this act a wholesaler shall be construed as being a person, firm or corporation who assemble in his warehouse a full line of goods carried in his special branch of business. and distributes them to the trade, but who has no retail counter and who does not sell to the consumer.

"Jobbers"—Persons, firms or corporations who sell for the purpose of re-sale and who have no retail counter and do not sell to the consumer.

"Retailers"—Persons, firms or corporations who sell to the user or consumer or who have a retail store or counter. This classification to include in addition to their classification as manufacturer or wholesaler the departments or agencies of such manufacturers or wholesalers who have such departments or agencies through which sales are made to the user or consumer.

The "Made-in-Canada" propaganda came in for a considerable amount of discussion in which a large number of those present took part. The following resolution was finally adopted. That this conference suggest to their respective organizations the advisability of recommending to the Government the setting aside of a sum in the budget to be used for a campaign to advertise Made-in-Canada and Made-in-Canada products.

J. A. Banfield, of Winnipeg, president of the Retail Merchants' Association, presided at the meeting, and J. T. Stirrett, of the Canadian Manufacturers' Association, Toronto, acted as secretary.

General Review of Business in U. S.

The Fidelity and Deposit Company of Maryland made an extensive and comprehensive survey of conditions from nine large districts into which, for convenience, the United States was divided. This survey is a review by all business men, prepared with every effort to insure accuracy and based on interviews with bankers, merchants and manufacturers.

A summary of questions and answers is given below. The number in brackets indicates the divisions giving the answer, 9 indicating unanimity:

1. Is there a marked resumption of industrial activity? No (9).
2. Is buying by the public still restricted? Yes (9).
3. Do industrial concerns report continued cancellation of orders? No (9).
4. Have retailers stocked up in expectation of a good spring business? No (9).
5. Have retail prices been reduced in the same proportion as wholesale prices? No (9).
6. Has the cost of living diminished appreciably since last September? Yes (9).
7. Are industrial concerns carrying large amounts of customers' paper? Yes (9).
8. What problem has the greatest bearing on business prosperity Taxation—Railroads (9),
9. Are general transportation conditions good? Yes? (9).
10. Are raw materials plentiful? Yes (9).
11. Have any failures of importance occurred since last September? No (9).
12. Are there any strikes? Yes (2). No (7).
13. Have there been any appreciable wage reductions? Yes (8). No (1).
14. Has the productivity of labor per man increased or decreased since September? Increased (9).
15. Are building operations increasing or decreasing? Decreasing (2). Increasing (7).
16. Is there need of building construction and in what class? Yes, low-priced dwellings (9).
17. Is sentiment favorable to building operations at present cost? No (9).
18. Are banks supplied with funds to lend? Yes (8). No (1).
19. Over a six months' period have deposits increased or decreased? Decreased (7). Increased (2).
20. Have corporation accounts increased or decreased? Decreased (9).
21. Have savings accounts increased or decreased? Increased (4). Decreased (5).

22. Do local indications point to increase or lessened government tax revenue this year? Lessened (9).
23. Is a higher tariff desired? Yes (5). No (4).
24. Have farmers disposed of all their last season's crops? No (9).
25. What is crop outlook for this season? Fair (4). Good (5).
26. Are farmers withholding payment of bills? No (2). Yes (7).
28. Is there a demand for farms this year by renters? No (6). Yes (3).
29. Is condition of sheep and cattle men fair or poor? Fair (7). Poor (2).
30. Is there noticeable movement of men to farms from industries? No (9).
31. Is there a noticeable increase in crime over last September? No (4). Yes (5).
32. Should excess profit tax be abolished? Yes (9).
33. What substitute would you favor? Sales tax (9).
34. What is the big local question? Shortage of houses (6). Taxation (8). Labor adjustment (4).
35. What is the big national question? Taxation (8). Tariff (2). Peace settlement (3).

Practical Upholstery

An interesting and practical work covering upholstering in all its branches has recently been issued by Benn Brothers, Limited, London, England, under the title, "Practical Upholstering and the Cutting of Loose Covers." The author, Frederick Palmer, is an upholsterer of wide experience and an enthusiastic follower of this craft. This book, which deals with the different operations and different classes of work in a clear, practical manner, is illustrated with over 400 sketches, showing various phases of the work. It differs from many of the works on this subject, which have been published, in that it is neither amateurish or elementary but was prepared by a practical man for practical men. In his introduction the author remarks that upholstery depends largely on tradition. There is no trade which has been so little affected by modern machinery. It has always been and remains a handicraft, and moreover, one in which a high degree of skill and deftness is needed. In "Practical Upholstery" it has been my task to lay bare all the inward parts with the frame or sketches and building up the structure process by process until the final covering. It is a book that should appeal to all practical, progressive upholsterers.

New Zealand Box Trade

New Zealand offers a potential market for Canadian-made boxes and box shooks. These would be used chiefly for packing butter for export and would necessarily be made of some wood which would not taint the contents in any way. The price would be another factor, for it would be necessary to compete with certain New Zealand boxmakers. However, if Canadian box men can produce a product from suitable wood, at a favorable price, a large volume of business could be secured.

A suggestion box with a good reward for workable ideas will help to encourage everyone to take an interest in their firm.

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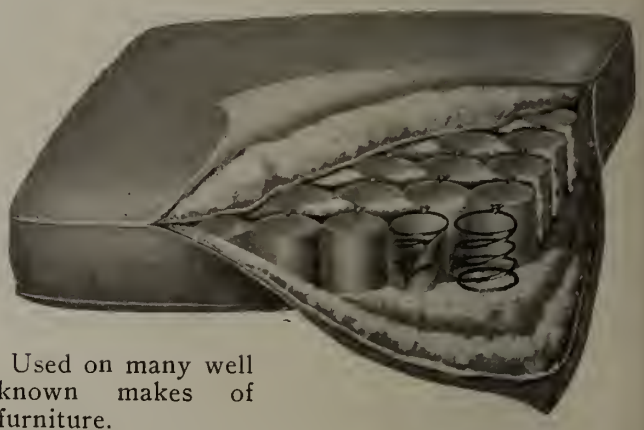

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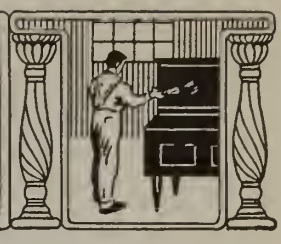

Drying of Varnish in Special Kilns

Temperature and Circulation Prime Essentials—All Factors Subject to Rigid Control—Like Dry Kiln, Intelligent Operation Required for Best Results

By C. A. Cutler*

(Concluded from March issue)

Consider the reverse action when the heated and conditioned air is introduced into the top of the kiln and does its work on its downward course. The air will spread out evenly at the top of the kiln until it comes into contact with a cooler surface. As quickly as it gives up any of its heat it falls to a lower level and is replaced by the continuous supply of warmer air coming from the heater. The cooler it gets, the more rapidly it falls. The more rapidly it falls the sooner it returns to the heater. It is never opposed in its natural path. If one part of the kiln was loaded with material of a lower initial temperature than the other parts, the circulation would be most rapid at that point until the temperature had been evened up. The tendency would be to create an even temperature in all parts of the kiln and no piece would ever be heated to a greater temperature than the controlled incoming air. By introducing the heated air at the top and at one side of the kiln, and taking the air out at the bottom on the same side, the air in the kiln has enough of a lateral motion to move freely between parallel horizontal surfaces causing them to dry more rapidly and more evenly than would be the case if the heated air was rising up through the materials.

Securing Even Temperature

Suppose the air on the floor line is drawn into a fan and then heated and delivered again into the top of the kiln. The mechanical assistance of the fan will increase the speed so that the air will reach the floor line at a temperature only a few degrees cooler than when it entered at the top of the kiln. The air coming into the kiln must not have a speed that could be called even a breeze. It is necessary that the intake and discharge of air be of great volume but at low speed, otherwise there would be a direct blast of air that woud carry dust to the varnish surfaces and a disturbance of the natural currents that would result in uneven distribution of the drying air.

If the same air was circulated continuously it would soon become loaded with turpentine and naphtha fumes which would delay the oxidation of the oil in the varnish. Not only would the fumes occupy the space which otherwise would contain air and thus reduce the available amount of oxygen but probably the small amount present under such circumstances would be largely taken up by the fumes themselves instead of by the oil.

To rid the kiln of these fumes, some sort of ventilation must be provided. The most rapid oxidizing conditions require that almost the entire proportion of oxygen that is present in fresh air be present at all times in the kiln. The more rapid the circulation the less amount of fresh air is needed per circuit but the number of cubic feet of air per minute needed for a given quantity af varnish is constant and unless that amount is provided the fastest drying will not be attained. Every cubic foot of air taken out of the kiln requires an equal amount to be admitted to the kiln but the cost of heating increases with each additional cubic foot of air admitted, so it is important to have accurate control of the ventilation system. That system that will provide the most fresh air for the least loss of heat is, of course, the most economical. There is at least one system that will maintain fresh air inside the kiln with no direct exchange of air. This, of course, results in a great saving of heating expense.

The control of the heating system has not been discussed until this time because it is dependent upon circulation and ventilation. As has been shown, radiant heat does not distribute evenly and so must be guarded against. The action of heated air has been described and it is this medium that is best suited for the purpose. Granted that a circulation of heated air is to be used, then the next problem is, what is to be the method of heating this air, because control of the heating means depends upon what kind of a heater is to be used.

Deciding on Type of Heater

When a rapid circulation of air has been established the maintenance of a given temperature is only a question of raising a given number of cubic feet of air per minute a comparatively few degrees. If, as described before, the air of the floor line is very nearly the same temperature as the air entering at the top of the kiln, then the problem is the raising of a large quantity of air very rapidly a few degrees. The heater best suited for this purpose is not a pipe coil. Pipe is most efficient when the air moves past or through it very slowly. A cast iron radiator is very much better suited because the air is so much longer in contact with the heating surface and the roughness of the surface causes slight eddies so that more air actually touches the heating surface than if it was smooth. Air is one of the best non-conductors of heat so that in the cast of a slow circulation a layer of air lying next to the surface of the heater will become quite hot before the air a short distance away has been heated at all. The usual effect of heaters is to heat a small quantity of air to a high degree and by mixing it with a larger quantity heat it all to a lesser degree. It is more efficient to heat a large quantity of rapidly-moving air to a slight degree so the heaters should be of relatively great surface, rough and open enough to allow a free and rapid flow of air and yet keep the air in contact long enough to heat it to the desired degree. This is on the same principle that it is easier to pick ten dozen ears of corn from a field containing one hundred dozen than it is to pick ten dozen ears

*President Cutler Desk Co., manufacturers Cutler dry kilns.

from a field containing only ten dozen ears. The higher the efficiency required to do a given thing the more difficult it becomes.

Absolute Control Essential

The control of a large heating surface is more difficult than of a small surface, and in this case not only must the surface be large but it must be so large that it will be able to furnish quickly all the heat needed to raise quickly the temperature of all the material in the kiln as well as the air in the kiln and, therefore, larger than needed for merely maintaining the desired temperature. The result is that during the greater part of the time the heat regulator is admitting only a small amount of steam. The steam distribution must be such that when heat is needed that all of the heater will be affected evenly by any small amount of steam admitted. This is, of course, a matter of piping, but it must be carefully laid out or uneven heating will result, even if all other conditions are correct.

Now, supposing all these elements have been properly combined and the best possible kiln has been built, there is still missing one very important item, an intelligent operator. The finest made Swiss watch will not give good service if it is not given good care and treatment. An apparatus of so complicated requirements is usually best obtained from some concern who have made a careful study of the problem so that an understanding of the general principles is sufficient for the average user, but the factory manager is missing a "good bet" when he does not insist on having every day a record of the kiln performances. These records should be part of his production system as they are or can provide definite information as to the stock moving through the finishing process, but in addition to this it will keep the operator from allowing the kilns, for which the firm paid their perfectly good money, from getting into a condition of nearly uselessness. This is not a reflection on the kiln but it is entirely a matter of maintenance and operation. The instant that the records do not show the results that are equal to the best performance the kilns are capable of, an investigation should be made to determine the reason. A machine that was not producing up to its rated capacity would be turned over to the millwright gang, and a kiln is entitled to the same care. A good kiln is not a "hot box." It is a carefully designed piece of apparatus that will give an excellent return on the investment if it is given the same consideration that similar apparatus in other parts of the plant is given.

Finishing Close Grained Hardwoods

Smooth Surface First Requisite—Suggestions for Different Woods—Much Depends on Skill and Knowledge of Operator

By Lyman Whiting

Satisfactory methods are only produced after long years of experience—through failures as well as successes. It is the knowledge gained from these ups and downs that demonstrates the best methods of finishing hardwoods.

The secret of successful finishing requires at the start a smooth surface which is entirely free from dust and markings, even to pencil or finger-marks. Unless a more or less colored finish is given, the slightest marks will show up in the finished surface, so attention paid to securing a smooth, bright, clean surface upon which to work will insure the finest results.

For a colorless finish, apply a first coater of white or bleached shellac thinned down pretty well with denatured alcohol. After this, the nail-holes or other small openings should be carefully puttied up with white lead, tinted with a little yellow ochre or chrome yellow. Be very careful that the putty matches the wood, but it should be slightly darkened, for the wood has a tendency to grow dark with the passing of time, while the putty, as a rule, will retain its original shade;

Sandpapering Important

Be careful that you sandpaper the first coat of shellac with a No. 0 paper, dust off thoroughly and then give a coat of good grade, pale interior finishing varnish, which may be thinned a trifle with turpentine. After this coat has become thoroughly dry, say after two days or so, sandpaper with No. 0 paper and dust off carefully. The intention in this case of sanding is merely to remove the gloss, and steel wool or curled hair may be employed with even better results than the sandpaper.

After this, apply a coat of the same varnish as previously mentioned, but use this as it comes directly from the can, without thinning as in the first coat. This latter one may be rubbed or two or three more coats may be applied, according to the quality of the work you have in hand—a rubbed finish demanding three coats of varnish, the last coat being rubbed with flour pumice stone and water or oil, then finish by polishing in the usual manner.

Another method is to flow on the last coat and leave it, which produces a fine luster finish, providing a high quality of varnish has been employed. Such a finish as this shows the wood in a most attractive form, and yet a dull rubbed effect is preferred by many, and looks well.

When finishing hard, Georgia or yellow pine, all three of which are about the same, only masquerading under different names, they really need no filling, the liquid used being really surfacers rather than fillers. This finishing, of course, all applies to the very light colored woods, and we can go on to the darker grades, cherry being one of them. This is usually finished in the natural, as it is of itself very attractive, having unusually pretty grain. But as a rule cherry is stained and finished to match other and more expensive lumber—mahogany, perhaps, being the most popular. For this a burnt sienna stain is generally employed, but aniline stain of rich mahogany should be used when deep and richer color effects are desired.

Overcoming Dark Streaks

Above all woods, cherry is one that must be made perfectly smooth and neat if the best work is to be expected. This, too, must be free from all marks and the surface perfectly clean, it being a close-grained wood which requires only a surface filling. We believe that shellac is the best material for this purpose.

Many rich oil stain and water stain are apt to leave a lap, which, of course, mars the beauty of the

finished work. If this does occur, it may be remedied by wetting the edge of the lap, and also that of the adjoining or unstained portion of the surface.

Another very beautiful hardwood which can be finished in the natural is quarter-sawed sycamore. I do not believe that any other wood has anything to compare with the beautiful grain of the quarter-sawed sycamore. It has wonderful markings, and its color is also peculiar to itself. When finished in the natural, there is hardly another hardwood which can surpass it for beauty.

Quarter-Cut Gives Best Effect

As a rule, any quarter-sawed wood gives a better effect than that which has been plain sawed, but both have some color, although not, of course, the same markings. Sycamore, as a rule, should not be stained, but finished up in the natural, following the same process that you would in finishing maple, that is, using a thin white shellac and varnish.

Another very handsome wood is beech, and it may be finished in the natural or stained with equally satisfactory results. Either mahogany, cherry or walnut stain will give a good color effect on beechwood. If finished in the natural, we believe it should be given a full gloss.

The quarter-sawed redwood gives perhaps the most attractive finish, and there is also a very handsome curly variety.

We believe that beech, birch and maple shauld be finished with a water stain, that is, wherever a natural finish is desired, although there are some finishers in our best factories that prefer a spirit or chemical oil stain. All this largely depends upon the skill of the workman. The woods just mentioned are close grained, have delicate markings and do not take stain readily unless they are transparent. The heavier stains you will note are apt to obscure the grain.

If you are employing a pigment stain, be sure that you wipe it off well in order that the beautiful grain may not be hidden.

Birch Takes Nice Finish

Red and white birch, the former having a sort of curly growth, are very fine. Birch may be stained to imitate several other woods, although when finished in the natural it is quite satisfactory. There are some finishers who claim that this wood is ruined by staining, but like so many other points, much depends upon the finisher.

There is really no filling required for close grained woods, yet in order that the action of water may be counteracted in the stain upon the grain, some prefer to use a paste filler. In this case it should be tinted to suit the color that you desire in the finish. Five pounds of paste filler may be made right for filling with the addition of a gallon of liquid. After the filling, the job should be allowed to stand twenty-four hours, then sandpaper well and apply a priming coat thinned to match the finished color, using for this purpose a lake pigment, and after twenty-four hours sandpaper again and flow on a full coat of high-grade polishing varnish. When allowed to dry, polish up in the usual manner.

Mixing Different Pigments

Golden red, dark red and golden constitute three satisfactory finishes, the gold finish being made from raw and burnt sienna and a very little lemon yellow. These pigments are mixed with first coater, following with a second coat of primer, and finished with polishing varnish. Undoubtedly red and yellow lakes will give a better gold effect. They will show the color tone the same as other pigments mentioned, with the difference that the coloring would be transparent, leaving none of the little flecks of color seen when using the other methods.

Burnt sienna is used in making the light red and the dark red is from burnt sienna slightly darkened with the addition of Vandyke brown. These stains should be thinned considerably with turpentine and sometimes the stains are incorporated with the first coater, the latter method being perhaps the better of the two.

Most finishers have their own plans and methods, but often they can profit by the experience of others. These suggestions are offered in the hope that they may prove of interest to other finishers.—"The Furniture Manufacturer and Artisan."

Reclaiming Waste Material

When ready to use the spraying machine for shellacing, the platform should be thoroughly cleaned. In addition to this one large manufacturer places a large frame at the back of the hood which reaches from the floor to the top of the hood. It is covered with cotton and will catch a lot of gum which together with the scrapings from the platform can be recut with alcohol and used again.

Before using for varnishing, the platform should be thoroughly cleaned. Strips of tin can be placed at the sides of the platform to catch the varnish. To remove the varnish from these strips put them into a tank of benzoin which can be easily constructed for this purpose. This will soften the varnish. The varnish can then easily be removed and with that taken from the platform can be thinned and used for other purposes.

The same practice also holds good for enamels. They can be recut with benzole and used for back or interior case work, etc.

In the staining room the table should be so constructed that all the waste stain will be held on the platform or in a trough around the sides. A hole can be made in the trough or platform from which it can be drawn off, and used again.

Keeping Sprayer Clean

The successful operation of a spraying machine requires that every part be kept in perfect condition, which may be taken to include perfect cleanliness. This is particularly true with reference to the exhaust fan. A little attention in this direction will lessen the wear and tear on the motors and cut down the power bill. To remove varnish, etc., from the fans take a can a little larger than the fan itself so that the fan can be immersed in some good paint remover. It is a good practice to clean all parts, such as fan, vent pipes, hood, etc., at least once a week.

If a good paint remover is not at hand, the following solution will be found satisfactory: 4 ozs. melted wax to which is added 1 gal. alcohol. It is not a bad suggestion to keep a can of this remover at hand and allow the gun or spray head to stand in it when not in use. The hose can be immersed in the same solution but should not be allowed to remain for a period longer than ten minutes. The practice of cleanliness is not only a good habit but adds to the pleasure and enjoyment which one receives from one's work.

Enamelling Presents Problems of Its Own

Special Attention to Each Coat—Judging Qualities of Enamel—Suggestions for Rubbing and Polishing

By R. S. Thorne

Important to a 100% enamelling job is to have the surface in good condition. All cracks, crevices, nicks or indentations should be filled with stick shellac and sanded off. It must be carefully filled with a white base filler, wiped and allowed to dry from 24 to 48 hours. It is then ready for a coat of shellac, which should be very thin, or what is known as a shellac wash. After sanding and dusting the furniture is ready for the first undercoat.

The undercoaters are made from snow-white lithophone ground in specially treated wood oil. Lithophone is an extremely dense pigment and makes an ideal undercoater, one that holds out the finishing coats in full, rich body, producing a finish that leaves nothing to be desired. Allow from 2 to 3 days for each undercoat to dry and sand lightly with fine sandpaper.

Color Undercoat to Match Finish

Two undercoats are usually applied. The first should be thinned with pure spirits of turpentine The second undercoat can be applied as it comes fro the can. If the finish is not white, the first undercoat should be tinted slightly and the second as near as possible to the color desired. An ivory tint is secured by adding chrome yellow. Some vary this by also using a little red or orange.

The furniture is now ready for the first coat of enamel. The enamel should be flowed on thin with a chiselled varnish brush. The brush is of great importance in good enamelling. It should be a good firm-haired bristle brush, preferably a flat hog's hair with a natural point. Soft brushes are not suitable neither are hard ones.

Qualities of Good Enamel

A good enamel should be easy to apply, should not show streaks or brush marks and should set reasonably slow, giving the coating an opportunity to flow out smooth. It could then be touched up several minutes after it is applied without showing streaks. If the enamel does not work freely, add a little t pentine. Where the enamel is pure white or what is known as a sickish white, it is the practice in some finishing rooms to add a small quantity of Pussian Blue or any other good blue. For the first coat of enamel use a mixture of about 2/3 enamel and 1/3 undercoater. This helps to knit the coats closer together.

These are the qualities of a good enamel: Good color and body, free flowing and easy spreading, steady drying and hardening without the loss of lustre. It should produce a porcelain-like finish that does not crack or chip off and is minus any suggestion of blu or pinkish cast.

Obtaining Final Finish

There are three ways in which enamelled furniture can be finished—eggshell. satin and gloss. The eggshell finish is not as satisfactory as the rubbed finish but the appearance will be about the same. If the regular enamel gloss finish is desired, the final enamel coat finishes the job.

A rubbed or satin finish may be obtained by rubbing smooth with powdered pumice stone and rubbing oil or water. An easy way to do this is to use a piece of rubbing felt which has been kept well saturated with the oil and water. Dip it in the pumice stone, rub the surface smooth, and be sure that all dirt o. dust marks have been removed. The enamel should stand from 6 to 7 days before rubbing.

The polished finish may be obtained by polishing with powdered rotten stone and polishing oil or water. It is best to use a soft cloth or cotton waste which has been kept well saturated with oil or water. Dip the cloth in the rottenstone and rub the surface until a high lustre appears. This rubbed finish ought to stand about 24 hours before polishing.

After the polishing it is the practice in some finishing rooms to rub lemon oil over the entire surface. Wipe the oil off with a piece of cheesecloth which has been dampened with alcohol. Too much alcohol will burn and ruin the finish. The safest way is to dip the cloth in alcohol, ring it as hard as possible, open out and swing through the air before using. The rubbing should be done as rapidly as possible. — "Finishing Facts."

"Hardwood Flooring Weeks" Arouse Interest

Hardwood flooring weeks are now becoming quite popular in Ontario. Under the direction of the Seaman-Kent Co., Ltd., of Toronto, in co-operation with local lumber dealers and hardware merchants, demonstrations have been put on recently in Hamilton, Brantford and Chatham. Among the other centres where "hardwood flooring weeks" will be observed in the near future are Sarnia, London and Peterborough. In each city a full-page ad. in a daily paper is taken by all the interests concerned, and suitable premises are engaged by the lumber dealers for display purposes. Much advertising matter in the shape of panels, cutouts and other attractive designs decorate the walls and windows, while the Seaman-Kent Co. provide an expert to give estimates and advice to all inquirers.

In Brantford recently the display premises were crowded with men and women interested in hardwood floors. The hardware dealers put on specially dressed windows, featuring brushes, mops, oils, varnishes, waxes, finishes and other allied lines. Several hundred inquiries were made, and as a result of the recent successful demonstration in the Telephone City the retail lumber merchants there have hundreds of names of prospective customers on their list.

The interest of scores in hardwood flooring has been aroused and the publicity propaganda shows what well-directed effort can do in the line of stimulating business and making people desire more cosy, comfortable and artistic homes and home fittings.

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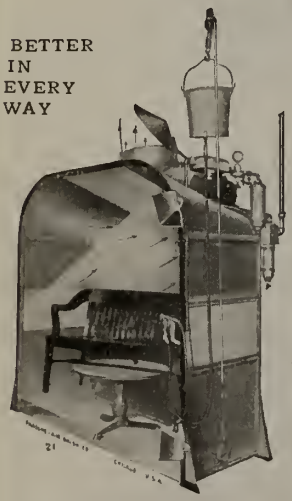

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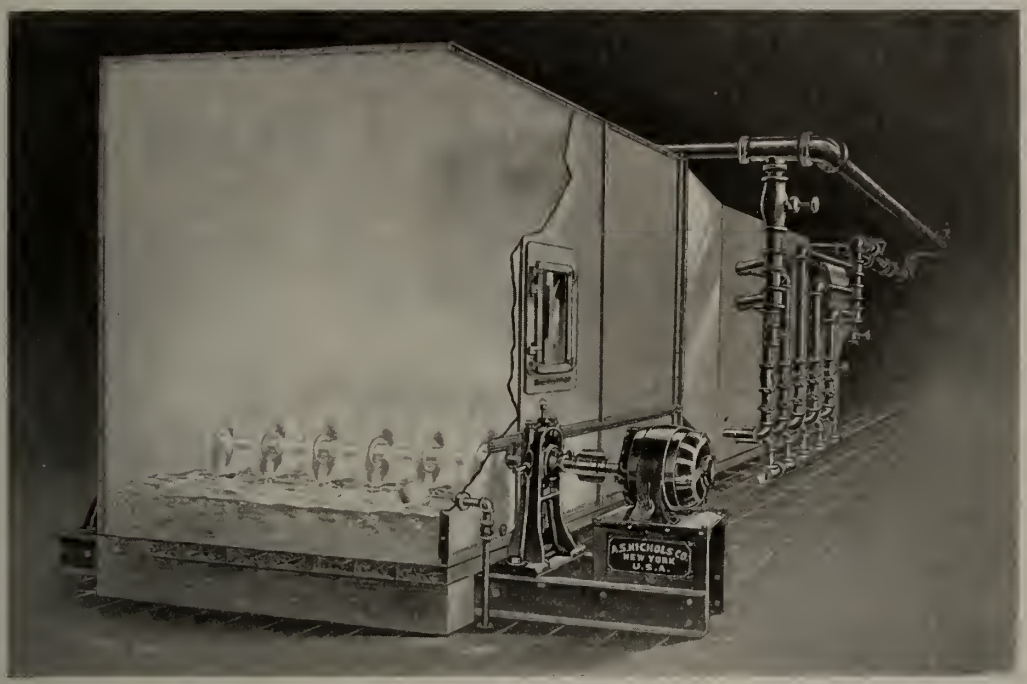

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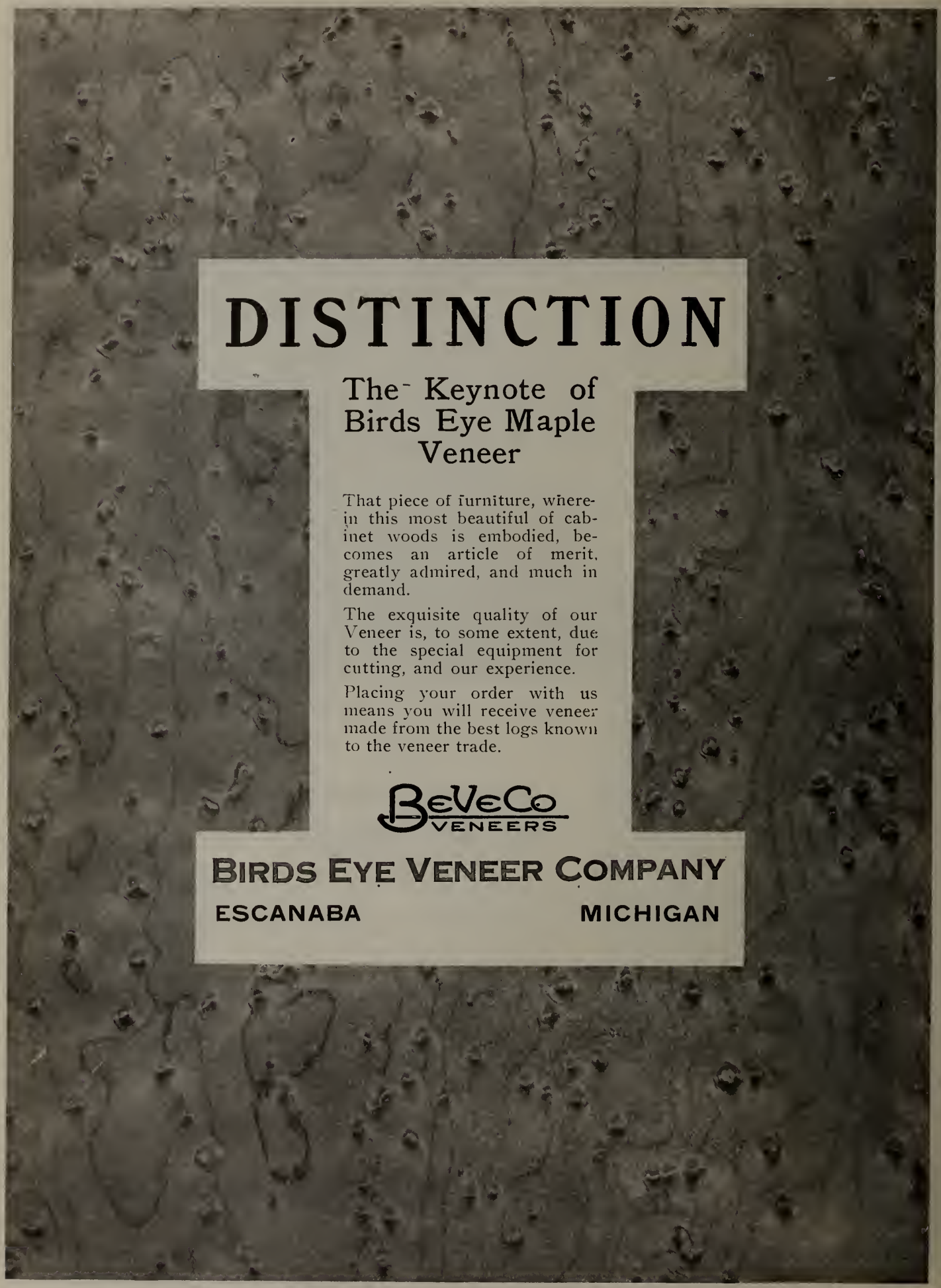
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Veneers and Panels

Can Checking and Warping be Overcome?

Basic Cause of These Troubles is Moisture—Will Elimination of All Moisture Prove Solution?—Modern Tendency to Strike at Cause, Not Counteract Effect

By R. F. Phipps

Of all the troubles encountered in producing veneered and built-up products, checking and warping or twisting are probably the most persistent. These undesirable results must be contended with and counteracted wherever plywood is used, for they are factors in the manufacture of high-grade as well as the cheapest lines of built-up wood products. Such items as loose and blistered veneers, defects and depressions in a finished surface may be termed troubles, but checking and warping are always with us.

This is an age of research in which we strive to find the cause of all our troubles and apply the remedy there, instead of merely trying to overcome the effect or result. Checking and warping are the result of some cause. If we can remove that cause, we have eliminated the result or effect. Sounds simple, doesn't it? Well, it is just about as simple as it sounds. The only trouble is that the average wood user making and using plywood will not take the lesson to heart.

Which Costs Less?

There are many, no doubt, who know the why and the wherefore of these things but who figure that they cannot afford to take the necessary precautions because it might increase the first cost of their product. Is there any difference between adding a few cents to first cost in an endeavor to remove the cause and spending good money in an endeavor to correct an effect in addition to having to throw out certain faulty material and also stand a loss through a depreciation in the value of the articles manufactured. There certainly is and it is all in favor of striking at the root of the matter and removing the cause regardless of cost. There is also the loss of prestige and reputation to consider.

Now to get down to cause. Practically all warping and checking can be traced back to moisture—moisture being eliminated or moisture being taken up. There are a few simple precautions which must be observed and which if observed and all moisture eliminated, both before and after gluing, checking and warping will not loom up to such a large extent as at present.

Dry When Laid

The time when veneers, crossbanding and corestock should be thoroughly dry, is not when such material is received, or placed in the store room or when it leaves the manufacturer's plant but when it is about to be glued. It is the moisture in the stock at the time of laying or gluing that counts and which must be eliminated. This practically means redrying. It certainly means the elimination of all guessing or supposing with regard to the moisture content of the material about to be laid. Testing must replace guessing. If the moisture content is above the permissable maximum, say, 4 per cent. on an oven-dry basis, and it likely will be, this excess moisture must be removed. There is no other solution or remedy. After conducting a series of moisture-content tests, one will probably come to the conclusion that all stock must be redried to the desired point before laying. The reason for it is this, that it will be found that the amount of moisture in nearly all material is in excess of the limits set.

Redrying may be conducted in many ways. With the aid of hot cauls, hot plate redrier or a specially constructed hot box or room in which heat, humidity and circulation are subject to control. This will insure that the material is in prime condition when laid.

Speed Prime Essential

The laying operation must be conducted as quickly as possible and the work placed under pressure immediately. This will tend to prevent any undue amount of expansion on the part of the face stock, because of moisture absorbed from glue. The sooner the pressure is applied, the less the expansion. With a limited amount of expansion, the subsequent contraction or shrinking is also less. It is this shrinking, due to the elimination of glue moisture, which is largely responsible for checks.

In view of the fact that the material absorbs a certain quantity of glue moisture, one naturally wonders if it is so essential that the stock be absolutely dry before laying. Many fall down on this point. They think that a few extra degrees of moisture content before laying does not make much difference, especially in view of the fact that the glue adds to the moisture content and that all this water must be removed after the pressure is released.

First and foremost removing all moisture from the stock before laying reduces the degree of moisture content to which the piece may attain while being glued. Suppose 12 per cent. is taken up from the glue. If stock contained 10 per cent. before laying the moisture content would reach 22 during gluing, whereas if 4 per cent. was the amount of moisture in the stock, the final degree reached will be 16 per cent. Anyone familiar with the drying and seasoning of wood knows how much checking, warping and twisting this extra six points of moisture might cause.

When Wood Shrinks Most

Again, wood shrinks most as the last of its moisture is being removed and swells most with the first moisture taken up, so that more swelling takes place while the first 10 points are being absorbed than during the time the next 12 are being taken up. That means

that stock laid with a moisture content of 10 per cent is laid in an expanded condition. By drying it and rushing the work in press, pressure may be applied before the moisture content of the face stock is anything like as high as 10 per cent. The amount of pressure applied is sufficient to check expansion even though more moisture is taken into the wood. Thus by working dry stock and working quickly, the amount of expansion and subsequent contraction, is limited.

The next operation is removing the glue moisture. This can best be accomplished in special humidity-controlled kilns or hot room. The pieces must be piled carefully so that they will lie flat, during the drying process. After being dried, they must be kept dry, otherwise the good work done is nullified to a certain extent. A dry panel will warp if exposed to moisture as well as when the moisture is being removed.

The time is not far distant when panel-making and veneering will be reduced to an exact science and conducted along predetermined lines. In that event every plant will have suitable veneer and panel-drying apparatus and rooms and the work so organized that all veneer stock and all core, and other material to be veneered, will be placed in a special drier some days before it is required and thoroughly conditioned before being sent to the veneer room for gluing and laying

Waterproof Glue in Woodworking Plants

Cold Water Glue Finding Favor—Giving Satisfaction in Door and Panel Plants—Heat Not Required in Mixing or Applying

By S. H. Johnstone

Request for Article

A subscriber has written in expressing a desire for an article dealing with the handling of waterproof adhesive in the glue room of the ordinary woodworking plant, with particular reference to sash, door and joint work. Hence the accompanying article. We are always glad to receive requests for information and articles pertaining to any phase of woodworking and stand ready to comply to the limit of our ability. What will you have?—The Editor.

During recent years waterproof, or as commonly known, casein glues, have come rapidly to the fore. This development has been due partly to their waterproof qualities, partly to the fact that they have been more or less perfected and to the fact that they can be mixed and applied cold.

Early attempts to produce casein glue on a commercial scale and for ordinary industrial purposes were not overly successful. The product, while high in adhesive and waterproof qualities, lacked uniformity, was extremely hard on knives and cutters and was inclined to jell or thicken after being mixed for an hour or two. These objectionable features have been practically overcome and to-day casein glues are giving satisfaction in a large number of plants.

Mixed and Applied Cold

Like any other material, best results can hardly be expected until a person has handled it for a short while and mastered its peculiarities. It comes in the form of a fine, light colored powder and is prepared by mixing with cold water in the proportion of about 2 to 1 of glue. The exact proportions are furnished by the glue manufacturer and his instruction should be followed rigidly. The mixture must be stirred or agitated for a brief period and then allowed to stand for fifteen minutes. During this period a chemical action takes place and the resultant glue is ready for use. The mixing is usually accomplished in hand or power mixers. When prepared it may be applied by either brush or spreader.

For joint work waterproof glue is handled the same as animal glue, except that no heat is required either to warm the adhesive or the stock, and in addition the temperature of the glue room may be maintained at a very comfortable point. Sometimes the proportion of glue to water is increased for joint work, resulting in a stronger glue, but as intimated before, the instructions issued by the manufacturer should be followed to the letter. The stock may be removed from the clamp in from three-quarters to one hour, and surfaced after three hours have elapsed. Some casein glues set in about half an hour, but it is well to allow plenty of time as a margin of safety.

In building up laminated cores and stiles, the same procedure is followed. The glue may be spread by a spreader, if such a machine is installed. In using casein glue in a spreader equipped for handling animal glue, all heat is turned off, the glue being used cold.

Thin Veneer Work

In laying veneers either in panel or door work, the glue is spread in the ordinary manner and the material placed under pressure as quickly as possible. Heated cauls are not required, although it is necessary to use a certain number of cauls to even up the pressure and in some cases to insure a smooth, even surface. When laying a thin face mahogany or oak veneer, such as 1/28 in., great care must be taken not to apply too much adhesive, as if forced through to the surface, it tends to stain the wood. This is due to the alkali or lime in the glue. The preventative is a thin spread, using smooth rollers if a spreader is used, and removing the work from the retaining clamps in about 2½ hours. When staining occurs, the application of some 10 or 15 per cent. solution of oxali acid. In joint work, to remove stains, sand the joint, apply some solution and then sand lightly again.

When using waterproof glue, one feature that requires strict attention is the life of the glue, while in its liquid state. The earlier product was usable for from one to four hours after mixing, while the present-day product has been so improved that the majority of casein glues remain liquid for from 12 to 24 hours, while some special grades are being placed on the market, that will remain liquid for 5 or 6 days. For ordinary work and with everyday grades it is advisable to mix the glue in the morning and only make sufficient to take care of the day's work. During the very hot weather some woodworkers mix two small batches, one in the morning and one at noon. Glue that has been carried over from the preceding day may

be thinned and mixed with some fresh material and thus used up.

Owing to the fact that many casein glues thicken and deteriorate after they have been mixed from 10 to 24 hours, trouble is sometimes experienced when an attempt is made to work waterproof glue in the machines found in the ordinary door-making plant. This refers particularly to the machines which squirt glue into the dowel holes and those which apply the glue by means of spiral fingers. This may be overcome by careful manipulation or by the use of special glues, but must be handled with care.

When used according to directions, these glues make a strong joint; one that is impervious to heat, moisture, oils, etc. Figures recently issued by the Forests Products Laboratory, Madison, Wis., give a spread of from 35 to 55 square feet per pound, so that it has a good covering capacity. At the present time it has a wide application, being used in a number of different fields for a wide variety of purposes.

Should Five Plys Be Glued at One Time?

Success Depends Upon Methods Followed—Plenty of Heat Required for Animal Glue—Core and Cauls Must be Well Warmed

By John Welmers

Every glue has its advantages, also its disadvantages. They differ not only in strength and water resistant qualities but also in price and methods of use. When we look at the methods used in laying veneer with animal glue we are apt to think they are slow, but every manufacturer has his own opinions about speed and if he were not convinced that his is the best method, he would change. Sometimes prejudice keeps a man from changing over. He just will not listen to argument against his pet hobby, consequently he rides his hobby until he falls off, or until his hobby breaks down. Then he sees things as they are and is willing to listen to the other salesman.

In the matter of glues, though it does not pay to keep a deaf ear to all arguments, in fact that is the way we learn, by getting the other man's viewpoint, some methods appear slow to one man while to another, the opposite, would be true for he sees a little deeper than the surface. He weighs results and after all they are what count. Take for instance the matter of laying 5 ply. The difference in the methods used is great, but either method may pay. The usual custom is to lay 5 ply in two operations when using animal glues, however, there is hardly an excuse for doing the job in two operations.

Comparing Two Methods

For the sake of comparison we might consider the various steps necessary to make a 5 ply panel in two operations with animal glue. In the first place the cauls must be warmed, which is in itself a task, for each caul must be handled twice, first in the heater and next out, saying nothing of the space taken up by the water and the steam required to heat it. Then with the cauls warmed the method of laying the 3 ply is familiar with all veneer men.

After the panels are taken from the retainers, the job of preparing them for the next ply presents itself and is no small job, for the paper which is generally used to keep the panel from adhering to the caul is stuck to the panel and must be removed. A considerable amount of this can be pulled off, but what remains has to be taken off either by scraping, sanding, or sponging. Not only this paper has to be taken off but also the veneer tape. Right here is a point that is often used in defense of animal glue. It is contended by some that to glue up a 5 ply panel in one operation and leaving the veneer tape on the crossbanding, is bad practice, and there are few who do not admit this. Everybody has seen trouble due to the fact that the crossbanding blistered just at the point because the veneer tape let go or else separated in the middle. This is a bad feature and is the reason why some people do not make 5 ply in one operation. There are others again who think the trouble of this nature is so small as to be negligible.

Removing Paper and Tape

Going back to removing the paper again, we might discuss the various methods. A man that can get good results with scraping this paper off by machine, is a good one if he can do it without ripping up a little veneer once in a while. Sanding is also good but the sandpaper fills up with the paper so quickly that it hardly pays. Both scraping and sanding have the advantage of doing the job in one lick. With sponging, however, this is not true for the time alone required for the water to soften up the paper and glue is much greater than the time required for the same panel to go through the sander or the scraper twice. Then the paper must be scraped off by hand, after which the panel is piled along with the rest of them on stickers and allowed to dry.

Another point that is brought up frequently is that when the 3 ply panel is cleaned up by scraping or sanding, any little irregularities or high spots that may occur are levelled off and are not transmitted to the last ply only to be sanded through then. On the other hand if the cauls are not too soft and have a nice level surface, there is not much danger of high spots. They will not always remedy the little warps or turned-up corners, however, and it is these that are levelled off by the sander or scraper.

After the panels are all cleared up, things are gotten ready again and the last two plys are laid identically the same way as the first three sheets so is of no use to repeat the process. The drawback in laying 5 ply in one operation with animal glue, however, lies in the fact that the glue chills rapidly and this is practically the only thing we have to combat.

Trouble From Cold Cores

A manufacturer recently called my attention to a problem in his glue room. He was having trouble with the veneers coming loose and blistering. He had started laying 5 ply in one operation with animal glue some time ago, and experienced no trouble and was up a tree to know where the fault lay. Everything was done the same as previously, same glue, same equipment and everything. Upon investigation, I found that he commenced this little stunt early in the summer when things were naturally warm, but as soon as cold weather set in, his troubles commenced.

His glue room was nice and warm so he didn't believe the trouble was there. His glue room was warm,

it is true, but it wasn't warm 24 hours a day and 7 days a week, and that was the cause of his trouble. The fact that the stock to be veneered was close-piled accounted for cold cores. A truck load of close-piled cores does not warm up clear through, if left in a warm room for some hours, at least nothing like they would in the summer time when the temperature is up all the time.

Best Method of Heating

The problem then resolved itself into the fact that the stock must be heated, for there is not enough heat in a caul to warm up the glue next to the core sufficiently to make it soften or to keep it soft until the batch is pressed and finally held firmly in retainers. The methods for accomplishing this end may vary according to conditions in the factory. The glue room may have sufficient heater space to heat cores and cauls, but I do not believe I would advise putting the cores into a dry heater for fear they might be damaged.

A better plan would be to build a small kiln capable of holding a sufficient number of trucks to handle the business. Such a kiln should have provisions for circulation and also for controlling the humidity so as to keep the cores from drying out too much. Then the cores could be piled on stickers on trucks and the entire load pushed in the kiln. Conditions in the kiln should be such that the cores would reach the temperature of about 90° F., which is sufficiently warm to keep the glue from chilling and until pressure is applied. Then when ready for use, the only thing necessary would be to push the truck alongside the glue spreader and get busy, thus saving at least one handling. So, when looking at the proposition from both sides, we can see that each has its advantages and where speed might be attained one way it might be lost by defective workmanship.

Sanding Practice and Quality Veneer Work

Value of Fine Sanding More Widely Recognized—Cutting Down Face Veneers Not Way to Correct Faults in Cores—Better Sanding Demand of Future

By A. Monmouth

With the present disposition to apply engineering ideas and practices and scientific analysis to the woodworking industry, the question of sanding machines and sanding practices should logically come in for a big share of attention. Moreover, this will have a distinct hook-up with the veneer-using industry because of two things. One is that it is this industry that has led to the biggest development in sanding machines and the practice of sanding by machinery. On the other hand, sanding is something we are realizing as a very important factor, both in the quantity and quality of veneer work done. In a word, the veneer industry has brought much more sander work into wood using, while on the other hand, proper sanding is helping to refine the work of veneering and reduce it to an art.

The present purpose is not so much to discuss sanding machines in detail as to give consideration to the matter of when and where sanding should be done and how it should be done. In other words, the matter of service the machine should perform, and why.

More Sanding than Formerly

We are realizing, for one thing, that it is advisable to do two or three times as much sanding as was formerly considered necessary in the course of making and finishing woodwork. In the old days of solid wood the only sanding done was that on the outside of the finished surface, and then only the exposed surface that was to be stained and varnished. The first machines to enter this work were disc sanders, drum sanders—that is, the round, stationary drums over which shaped pieces like chair rockers were held by hand to polish off saw marks and smooth the surface. Small, flat surfaces were sanded on disc sanders in similar manner, while for the larger surfaces disc sanders were mounted on jointed arms so that they could be moved about over the surface of the work.

Then came the drum sanders, put up somewhat in the form of planers with power-feed rolls, and out of these were developed the modern drum sander with a series of drums, sometimes fed with rolls and sometimes with endless beds, with flexible rubber mats to take care of some variation and unevenness in thickness. Meantime, until veneering came along to multiply the quantity of production and of surfacing needing sanding, quite a lot of the finer sand work was done at the cabinet benches by hand. Along about the time veneering was being developed there was also brought out the idea of belt sanding, as applied to cabinet work, which has done much to replace a lot of the old hand sanding. The belt idea in sanding had long been used for polishing turned articles, the belt running over fixed pulleys and the work being held against the belt by hand or with some special device. The later development, however, was out of the conception of applying a combination of the belt and table idea, to finishing off cabinet work.

More Sanding Necessary

Out of all this we have developed today an interesting line of power-driven sanding machines, and among them any man can find mechanical equipment to do effectively almost any kind of sanding desired. The main questions here are those of getting quantity and production sufficient for given kinds of machines to justify several, or getting a machine that is adaptable to a wide range of uses, so as to get effective service in the matter of time and labor-saving in sanding. This part of the work has made splendid progress. The point meriting special attention now is that of the extent to which sanding may be profitably employed and the manner in which it should be done to produce satisfactory results.

The broadest field of possibilities is that of the increased quantity of sanding which may be profitably done. When the industry first started using veneer it was inclined to follow the sanding practices of solid-wood working—that is, just to finish off the outer surface. In the course of time and in the process of refining it was learned that to get a good finish with fine face veneer, especially when cut thin, the cross-banding or corebody underneath the face veneer should first be scraped or sanded and reduced to a smooth, even surface. Following this matter further, we find in many cases that it may be advisable to do

(Continued on page 130)

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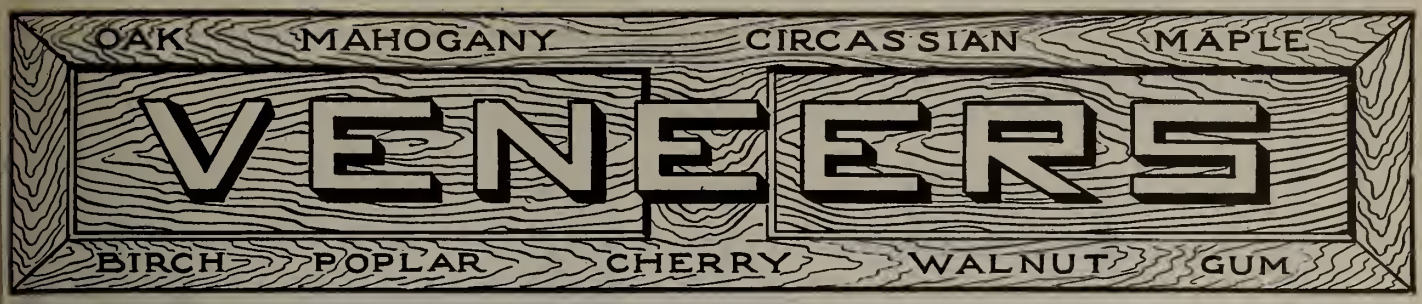

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5/4"	14,165 "
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5/8"	840 "
3/4"	8,940 "
4/4"	32,400 "
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8/4"	1,500 "
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12/4"	500 "
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4/4"	32,940 Feet
5/4"	27,530 "
6/4"	21,480 "
8/4"	33,590 "
10/4"	16,850 "
12/4"	6,054 "
16/4"	1,332 "

NO. 1 COMMON

3/8"	8,000 Feet
1/2"	27,380 "
5/8"	29,850 "
3/4"	31,285 "
4/4"	59,675 "
5/4"	38,240 "
6/4"	18,750 "
8/4"	39,240 "
10/4"	16,363 "
12/4"	4,768 "
16/4"	1,604 "

NO. 2 COMMON

3/8"	1,500 Feet
1/2"	1,900 "
5/8"	4,500 "
3/4"	2,190 "
4/4"	72,250 "
5/4"	47,890 "
6/4"	31,720 "
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VERSATILITY

—*The Keynote to Operating Efficiency*

Versatility of manufacturing requires a complete assortment of manufacturing facilities and a supply of varied raw materials, all of high character. Our long successful record has been developed on a plan which aimed at an organization which could fill any and all requirements for high grade hardwood materials. That versatile organization maintains contact with a tremendous supply of splendid timber and incorporates four band mills and three veneer mills, each designed for the manufacture of a specific product. The result is the best obtainable in quartered and plain white oak lumber, sawed quartered oak veneers, walnut lumber and sliced and rotary cut walnut veneers, rotary cut yellow poplar crossbanding and a general line of high-grade hardwoods—an offering and a service that warrants your inquiries.

WOOD-MOSAIC COMPANY

Chicago Representative
GEO. W. STONEMAN & CO.
845 Erie St.

Incorporated
Louisville, Kentucky

Grand Rapids Representative
HECTOR ROBERTSON
232 Lyon St., N.W.

ALGOMA *the Better* Plywood

You be the Judge—Put Algoma Plywood on trial. Test its right to the title, "the better Plywood." You can sit in judgment on its performance by using an order in your own plant. See if it has a better surface —measure the accuracy of every dimension—examine the matching of the grain—watch how the panels you use stand up under use. Then you can decide for yourself whether Algoma Plywood deserves to be used for every job you turn out.

We do not urge you to make this test for the sake of selling one order. Our business has grown for 35 years by winning steady customers. We frankly ask you to try Algoma, the Better Plywood, because we are convinced it can win you as a regular customer.

You can get an Algoma Plywood made to fit your special requirements in either curved or flat panels. Our stock size panels bring you economy through standardized production. Let us send you estimates.

ALGOMA PANEL COMPANY, *Algoma, Wis.*

at least two sandings previous to and aside from the finishing off of the face veneer before varnishing. Suppose, for example, one is making a heavy table or dresser top and the body is built up in the form of what we know as solid corebody. This means that there is a series of strips of solid lumber, matched and glued together edgewise to make up the desired width. This should be crossbanded, after which the thin, fine face veneer is applied.

If the crossbanding is thin, too, the logical place to start smoothing up is with the solid corebody. Maybe you feel that running it through the planer is enough, but for fine work, where both the crossbanding and the face veneer are thin, say from 1/20 to 1/30-in., it is obvious that any wrinkle or unevenness in the corebody will show through and mar the beauty of the finished work. Therefore, for a fine job the logical starting place is the solid corebody. This should be scraped or sanded, or both, to get it even and true as to surface and to get it smooth and in good condition to take the glue. Then on top of this should go the crossbanding as one operation. It should be allowed to dry, then the surface sanded off again as a preparatory step to applying face veneer. Thus we have multiplied the quantity of sanding three times.

When we come to apply scientific analysis and engineering ideas to this matter of sanding in connection with the veneer industry, we will find a number of interesting things. One of them is that by increasing the number of times we do sanding in the process of making up a piece of flat cabinet work, we lighten the work or lessen the burden for each sanding and make the final sanding much lighter and more delicate than if we had no previous sanding. That, in turn, brings out the question of refinement in sanding operations, which is the real meat we are after in the present discourse.

The makers of sandpaper have performed a good service for the industry by awakening a keener interest in the subject of sanding, through analyzing in detail the process of making sandpaper. We have come to realize through the enlightenment resulting from the awakened interest that there is an element of quality and refinement involved, and this is the element which really merits the earnest attention of the industry both in the matter of sanding machines and sanding practices.

The big thing the industry should get out of an applied study of sanding machines and practices is a higher quality of work, which will mean a finer quality in the finished product. We are realizing, for example, that sandpaper must be very carefully made and overhauled so that it will cut smoothly and not scratch. We should seek for this same uniformity and delicacy in the adjustment and operation of machines, and to seek to get smooth, free cutting without scratches and scorching and other things to mar the quality of the work, and to have efficiency of the machines and sandpaper. In a word, we must seek for more accuracy in machine adjustment and operation, as well as for more refinement in the sand and sandpaper used. Those who use belt sanders and apply the sand themselves, must learn to do this properly, otherwise it would be better to have it done by others specializing in this work. There is an interesting question here whether it will not profit the industry to submit its preparation of sand belts to people specializing in this work, who can equip themselves to do it much better than it can be done in the average woodworking plant. If the makers of sand belts, for example, take anything like the pains in making them up and sanding them that the sandpaper people take in putting up high-grade sandpaper, they probably make a much better job of it than the average users of sand belts can do themselves. In that case it will probably pay to stock up with sand belts and return the used ones for recoating, where they are equipped to do this scientifically so as to insure evenness and quality.

The industry, in the course of applying scientific analysis for future progress, will find it necessary to do more sanding and better sanding. This, while it will call for some ingenuity to devise machines and methods which will reduce the cost of handing and sanding to a minimum, will also call for a closer study of the results obtained in sanding and for more exactness in both machines and practices. When we get this, when we get the habit of applying science and more exactness in everyday practice, we will not only find more interest in the work, but we will find developing out of it a greater care of efficiency in the working of sanding."—"Veneers," Indianapolis.

Plywood Reinforced with Wire Stitching

In England a type of plywood known as "consuta plywood" has been developed for use in the manufacture of automobile tops and bodies, motor launches and boats of all kinds and in the construction of air and seaplanes. This plywood, which has been developed from the copper-sewn methods of boat construction, consists of a number of piles of wood glued together, using waterproof glue or cement with the grains turning in different directions and then lock-stitched with fine copper wire. The stitches run lengthways in rows of 1¼-inch pitch and may be countersunk so that a smooth surface is secured. It is manufactured in sheets up to 8 feet wide and as long as 60 feet, and usually runs from ⅛ to ⅝ inches in thickness. For boats and aircraft, mahogany and cedar are generally used, but any suitable wood may be employed. In the construction of tops for car bodies, such as coupe and sedan bodies, it has been found that the consuta plywood is lighter than steel and there is an absence of drumming and creeking. Such material has a very wide application as it can be used to advantage for a large number of purposes.

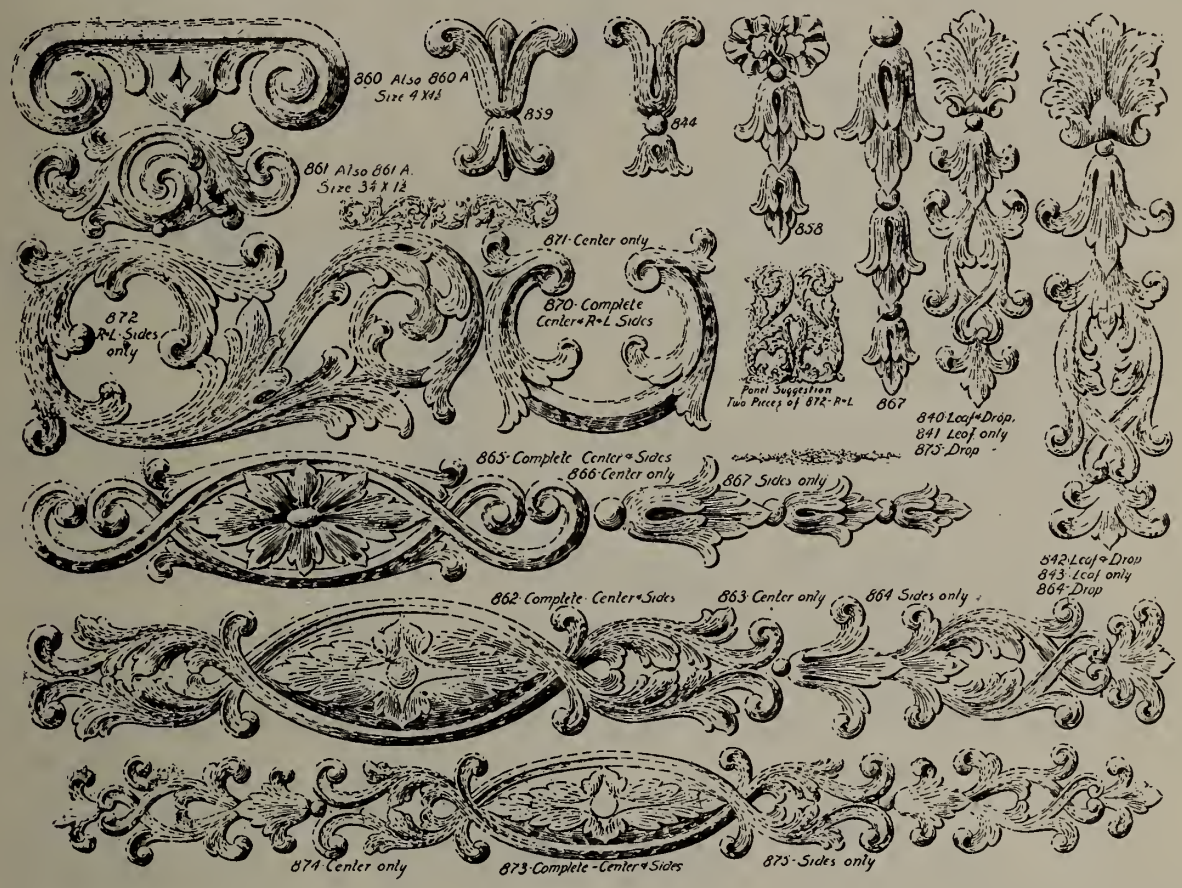
100% EXCELLENCE

Manufacturing
High Grade ROTARY CUT VENEERS
Specializing BIRCH DOOR STOCK,
MAPLE PIANO PIN BLOCK STOCK

Years of Experience Behind Our Products

The Munising Woodenware Co.
MUNISING, MICH.

Wood Fibre Carvings



ORNAMENTATION FOR

Furniture	Churches	Altars	Steamships
Offices	Schools	R. R. Coaches	Show Windows

Thousands of designs to choose from

WE INVITE YOUR INQUIRIES

J. WALTER & SONS

KITCHENER - ONT.

Information and Inquiries

You are cordially invited to make use of this department

Upholstering Supplies

Montreal, April 4th, 1921.

Editor, Canadian Woodworker:—

Will you kindly tell us where we can secure the following material: moss, wood for bowling alleys, linings for chesterfield suites, coverings and general upholstering supplies?

Yours truly,
Montreal Store Fixture Co.

The Griffin Curled Hair Co., Toronto, and Bauers, Limited, Waterloo, Ont., should be able to supply you with moss and filling. Wood for bowling alleys could be secured from the Brunswick, Balke, Collender Co., Hanna Ave., Toronto. This firm specializes in bowling alley equipment and could furnish you with the stock for a bowling alley manufactured and cut to size ready for assembling.

The A. F. Burch Co., of Grand Rapids, Mich., manufacture a line of upholstering covers and would, no doubt, be glad to furnish you with full particulars of their line. Linings may be secured from Landers Bros. & Co., Limited, Toledo, Ohio.

Fasteners for Attaching Mirror Standards

Toronto, March 31st, 1921.

Editor, Canadian Woodworker:—

Will you kindly tell me where I can get screws for fastening mirror arms or posts to the case top. This screw is threaded on both ends and one end is fitted with a thin washer nut suitably notched for tightening.

Sincerely yours,
C. N. Glover.

This fastener is known as the "Tillotson Fastener" and can be secured from almost any manufacturer or jobber of furniture hardware. Any one of the following firms can take care of your requirements: Weber-Knapp Co., Jamestown, N.Y.; Keeler Bros. Co., Grand Rapids, Mich.; National Brass Co., Grand Rapids, Mich.; Hammacher, Schlemmer Co., 4th Ave. and 13th St., New York.

Canadian Hardwoods Wanted

An importer in Paris desires to get into communication with Canadian exporters of hardwoods, Douglas fir and cedar. Is prepared to order a sample shipment of different Canadian woods as an experiment with a view to specializing in lines which are most suitable. Quotations should be made in both Canadian and metric measurements. In this connection the Canadian Government Trade Commissioner in Paris reports that he has recently received several inquiries in regard to Canadian woods, especially hardwoods, which are practically the only ones known in the French market. There appears to be a scarcity in France of woods suitable for the manufacture of furniture, doors, etc., and this fact indicates that there should be an excellent opportunity for Canadian manufacturers to open trade connections. Quotations should be in the metric system, or a comparison made between metric and Canadian dimensions.

Braces for Card Tables

Editor, Canadian Woodworker:—

Could you advise me as to where I could obtain braces for card tables?

Sincerely yours,
J. H. Atherton.

We believe that the Weber-Knapp Co., Limited, Jamestown, N.Y., could take care of your requirements in this line. If they do not handle a suitable brace, we would suggest that you get in touch with the National Brass Co. or the Keeler Brass Co., both of Grand Rapids, Mich., or Hammacher & Schlemmer Co., 4th Ave. and 13th St., New York.

Wood Mantels Wanted

New Glasgow, N.S., March 30th, 1921.

Editor, Canadian Woodworker:—

Will you kindly tell me where I can secure some wood mantels finished in the different shades which are in demand?

Thanking you for your kindness, I am,
Yours truly,
G. H. Grant.

Almost any operator of a woodworking plant would be glad to accept your order for a number of mantels made as required and to your own design. The W. A. Moore & Co., 11 St. Albans St., Toronto, specialize in this line. No doubt they would be glad to furnish you with their catalogue on request.

Early English Finish

One large woodworker writes in asking how he can finish oak in what is known as the Early English Finish. The lines manufactured include extension tables and articles of a like nature. We furnished the following suggestion, but would appreciate it if some of our readers would supplement this information by outlining their methods:

Stain

Ground walnut crystals	2 oz.
Black, P. B.	1 oz.
Water	1 gal.

In applying this stain the work should first be sponged with a solution made by dissolving ½ oz. lye in a gallon of water. After this application has dried the surfaces should be sanded lightly and the stain applied. The wood is next filled, using a very dark filler. Sand thoroughly with fine sand paper and finish with one coat white shellac and two or more coats of clear varnish.

Special Equipment Required

Montreal, March 24th, 1921.

Editor, Canadian Woodworker:—

Can you tell me where I can secure a tapering machine such as is used in the manufacture of fishing rods?

Yours truly,
W. Finkletin.

We do not know of any machine made for this special purpose. If you are making fishing rods on a scale to warrant the expenditure, no doubt you could have one constructed to your order. Where fishing rods are made in small quantities, the usual method is to work them out by hand.

VENEER OF QUALITY

We carry in stock, for immediate shipment, 3 and 5 ply Panels in Birch, Oak, and Mahogany — sizes 24" and 30" wide, 48", 60" and 72" long.

A complete range of American Walnut, Mahogany, Quartered Oak (in all thicknesses) Figured Gum Veneers and Rotary Cut Veneers is stocked at our plant awaiting your selections.

Our best advertisement is a **trial order**—because more orders come pouring in with requests to "repeat the same quality."

This is not a difficult request for us to fill because we handle nothing else but **quality veneers.** Let us convince **you.**

Toronto Veneer Co., Ltd.

1100-1104 Queen St. West, TORONTO, ONT.

Walnut, Quartered White Oak and Mahogany Veneers and Lumber

Prompt Delivery

LONG-KNIGHT LUMBER COMPANY

INDIANAPOLIS, IND.

Requirements of the British Market

The following information regarding the market, in Great Britain, for closet seats was gathered by Trade Commissioner, Norman D. Johnston of Bristol, England. The illustrations and descriptions indicate the kind of closet seats which find the greatest sale in the Bristol district:

Ring Seat

The closet seats without covers seem to be preferred in this country. The ring seat has a very extensive sale, in fact I think it might be said to have a larger sale than any of the other seats. It is most popular in hardwood, which is sold unpolished by the manufacturer at 5s. 5d. each at the present time. It is also sold in polished imitation mahogany at 7s 3d. each. Galvanized hinges are used, but brass hinges are preferred.

The ring seat is also made with a cover, but this style is not nearly as good a seller as that without a cover. If persons desire a seat with a cover they generally buy one of the more expensive kinds. The ring seat with cover is now bought from the manufacturer in imitation mahogany, polished, at 12s. each, and in solid mahogany, polished, at 19s. each.

Extension Seat

Probably the seat which finds the best sale next to the ring seat without a cover is the extension seat illustrated above. The manufacturers' price for this seat in hardwood unpolished, is 7s. 3d. each, in imitation mahogany, polished, 9s 6d. each, and in solid mahogany, polished, 17s. 3d. each. The one in imitation mahogany is perhaps in greatest demand.

One of the best, if not the best, seats with a cover as far as sales are concerned is the extension seat with cover. This seat is bought from the manufaceurer in polished imitation mahogany at 15s. 9d. each and in polished solid mahogany at 24s. 9d. each. In this case, as in most of the others, brass hinges are preferred.

What would likely be ranked third in order of popularity as a selling proposition is the standard seat without a cover. The manufacturers' prices are 9s. 6d. each in unpolished hardwood, 11s. 9s. each in polished imitation mahogany, and 21s. 3d. each in polished solid mahogany. Side hinges are used. This seat in solid mahogany is a good seller.

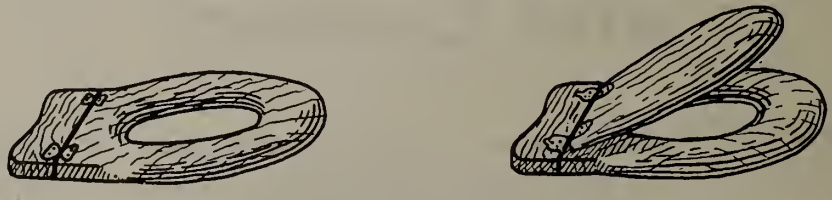
The standard seat with side hinges is also made with a cover. It sells in imitation mahogany polished, for 21s. 3d. and in solid mahogany, polished, for 31s. 6d. each.

There are other styles in demand but it is hoped that the above information will indicate some of the closet seats which find favor in this district.

Ten Commandments for Foremen

1. Be an optimist. Confidence is infectious.
2. Make few promises. Keep every promise made.
3. Every question has two sides. Always hear both.
4. Study your men. Put each where he can do his best work.
5. Never show discouragement. A stout heart will never say die.
6. Don't hold spite. Correct when necessary, but forgive afterward.
7. Notice good work as well as bad. Give credit and blame justly.
8. Be fair. A foreman often has to act as judge, and therefore must be just.
9. Control yourself. Anger is too valuable to use except on special occasions.
10. Take your full share of the blame. Sharing both blame and praise with workers is a big part of the secret of managing men.

Ring seat with and without cover.



Extension seat with and without cover.

Standard seat with and without cover.

LELAND G. BANNING

CINCINNATI, OHIO

Our Specialty:

SOFT OAK PLAIN AND QUARTERED

also **MOUNTAIN POPLAR**
WALNUT, ASH, CHESTNUT
OTHER HARDWOODS

Canadian Representative:
A. E. KLIPPERT,
11 LAXTON AVE.,
TORONTO, ONT.

BAND MILL:
FRANKFORT, KY.

1897 1853 1921

Veneered Panels

Ready for quick shipment in following veneers

Walnut, Plain Oak, Birch, Quartered Oak, Mahogany, and Maple.

3 Ply—1/4" thick and 5 Ply—3/8" thick.
Sizes—72 x 24, 60 x 30, 60 x 24, 56 x 25, 60 x 20, 60 x 18, 48 x 18.
also in quantities cut to size for
PHONOGRAPH CABINETS, FURNITURE DRAWER BOTTOMS, ETC.

Hay & Co., Ltd.

Woodstock, Ontario

The Lumber Market

Domestic Woods

Predictions are of little avail in attempting to outline the situation with regard to domestic woods. Business should be better than it is, but that does not make it so. The demand for all kinds and grades of stock is very low and does not apparently show any signs of improving. In the softwood market hemlock prices are away down, yet this decrease in hemlock values has not resulted in stimulating sales. Competition from B. C. woods and southern pines is very keen; in fact there is considerable comment because these woods can be brought in and sold at a price below that being asked for white pine. It is anticipated that there will be a drop in the price of B. C. products of from $2.00 to $2.25 per M during the next few weeks. This is due entirely to the drop in freight rates which went into effect on April 21st when the rate on lumber from British Columbia was cut to 90c a hundred instead of $1.03½ as at present. The new rate to Montreal will be 95c per hundred. The effect of this will be a reduction in the delivered price of about $2.00 per M. This will have some effect on building costs and should result in stimulating the construction of homes. There is an undoubted shortage of residential buildings and there should be a building boom during the coming season. Whether this will materialize or not it is difficult to say. There is every reason to suppose that a greater amount of building will be undertaken, yet building activities may not live up to expectations. Should there be a fair amount of construction work undertaken, it will, certainly, result in an increased demand for lumber of all kinds and should have the effect of stiffening values.

Stocks of all kinds are not any too plentiful and production is at a very low ebb. In the hardwood field the upper grades are very scarce, particularly in dry stock, but there is a considerable quantity of lower grades available. The price of these latter items has dropped while the upper grades are being maintained at a fairly high level.

The attitude of the lumber user and lumber consumer seems to be to put off purchasing as long as possible, and when forced to buy, to order in small quantities and look for quick delivery. This is evidenced by the fact that numerous orders are being placed for mixed cars in which there is a wide range of stock such as birch, maple, walnut, mahogany and oak, all in one car. Putting off buying is frought with danger for should the demand increase, prices are bound to stiffen and those wood users who have permitted their stocks to dwindle, may find that they will have to pay a price considerably in advance of that for which they could secure their requirements at the present time.

Imported Woods

The feeling of the hardwood lumber operators in the various American centres is that we are on the eve of new developments. Inquiries are coming in, in an ever-increasing number and more orders are being booked. This must not be taken to mean that the demand is anything like normal, but it does indicate that there is a slight increase in the amount of lumber being purchased.

In many of the hardwood sections there is an overproduction of low-grade stock and a scarcity, which almost amounts to a shortage, of the better grades. Shipments of lumber from the Memphis territory during March were larger than for any month since the depression in the hardwood industry made itself felt last fall. This is taken as an indication that business is on the increase and that the situation is gradually showing signs of becoming better. Production has been kept down to a very low point so that it is not improbable that available stocks have been cut down. Manufacturers of interior trim, flooring and finish and of waggons and implements are among the largest buyers. There is also a slight demand from the furniture industry.

In considering lumber values one must not overlook the fact that the heavy increase in freight rates, which took place last fall, has a very marked influence on present lumber prices. The lumber manufacturer is accepting a loss on nearly all stock sold. B. F. Masters, in an address before the National Association of Box Manufacturers, gave a concrete example of the effect of high freight rates on lumber prices at the present time. No. 2 gum is selling in Chicago at about $22.00 a M delivered. Under present freight rates, the freight on the stock is $14.00 a M, which leaves $8.00 for the millman. It does not seem possible that a lumber manufacturer can cut the stock and sell it for $8.00 and even receive his money back, let alone make any turn on the transaction.

It would appear to be the part of wisdom for all wood users to keep a fair stock on hand, for it will not take very much to stiffen values and shove the prices up. Each month means that we are that much nearer the time when things will commence to move. Whether the demand for lumber comes back with a rush or whether there is a gradual improvement it would seem as if values are bound to improve. It is not likely that the next few months or the next year will see lumber prices any lower than they are today. It would be little short of a national calamity were they to do so. Present values cannot last indefinitely, so that putting off the time when needed purchases are to be made is gambling against time. If the market revives, ever so little, in the meantime the person who has put off has lost. Help stabilize conditions by buying what you need and buying now. It would be good business.

Selling Flooring by Foot Measure

Several American manufacturers of hardwood flooring have suggested that in future hardwood flooring be retailed at the actual square foot or face measure, that is, the quantity required to cover one square foot, instead of flooring feet which are from 20 to 33 per cent. short of the amount necessary to cover a given space. To aid the dealer in quoting on this basis the following table has been compiled. This gives the price per square foot, square measure, covering the actual quantity required to cover one square foot, based on the regular quotations per thousand flooring feet. The figures in the first column are the retail price per thousand feet. The other prices are figured to include manufacturer's waste and are the selling price of flooring sufficient to cover one square foot. Allowances should be made for irregularities in shape of rooms and for floorlayer's cutting waste:

Canadian Hardwoods

Good Stocks
Right Grades
Prompt Shipments

:: Members National Hardwood Lumber Association ::

Crating
of all descriptions

C. A. Spencer, Limited
Merchants and Manufacturers
McGILL BUILDING - MONTREAL

THE
GALL
LUMBER
CO.
Limited

Established 1875

HARDWOOD
LUMBER

MAHOGANY, WALNUT

Office, Yards and
Service Dry Kilns
Foot of Spadina Avenue
TORONTO, CANADA

We are carrying a large and well selected stock of

Dry Canadian Hardwoods

consisting of

4/4" & 6/4" Brown Ash
4/4" & 8/4" White Ash
4/4", 5/4" & 6/4" Basswood
4/4", 6/4", 8/4" & 12/4" Birch
4/4", 8/4" & 12/4" Hard Maple
4/4", 8/4" & 12/4" Oak
4/4", 8/4" & 12/4" Soft Elm

May we have the pleasure of quoting on your requirements?

Canadian General Lumber Company, Limited
712 Bank of Hamilton Bldg.
TORONTO
MONTREAL OFFICE: 203 McGill Bldg.

Selling
Graves, Bigwood & Co.'s
Lumber, Lath and Box Shooks

News of the Trade

S. J. Cann, Exeter, Ont., has purchased a factory and intends installing some woodturning equipment.

The Gove Motor Car Co., of Detroit, Mich., contemplate erecting a Canadian branch at St. Catharines, Ont.

The Reynolds Motor Truck Co., London, Ont., contemplate adding a new unit to their woodworking plant.

J. A. S. Vincent, 307 Papineau Ave., Montreal, has commenced work on a one-storey carriage factory, 73 x 40 feet.

The J. T. Gilchrist Lumber Co., Limited, 496 Gladstone Ave., Toronto, are erecting a one-storey brick office at a cost of $3,500.

The Gove Motor Car Co., Tilbury, Ont., is being organized to erect and equip a plant to manufacture motor cars and trucks.

L. Turneau, 2 Concord St., Montreal, is fitting up a small workshop and is in the market for a circular saw, jig saw, shaper and lathe.

The Newport Carriage & Wagon Works, Whitby, Ont., has been sold to James F. Pirie. This is one of the oldest industries in Whitby.

A small fire occurred in the plant of the Hayes Wheel Co., Chatham, Ont. The blaze was extinguished before much damage had been done.

Montreal Paint & Varnish Company, Limited, Montreal, were recently incorporated to manufacture and deal in polishes, stains, varnishes and paints.

The National Steel Car Co., Limited, of Hamilton, has, according to a recent announcement, changed its name to The Hamilton Car Co., Limited.

J. Wills, 414 Arlington Ave., Ottawa, has commenced work on a small woodworking and carpenter shop. This building will be one-storey, 32 x 24 feet.

The Art Furniture Co., Limited, Kitchener, Ont., has been awarded a contract by the Dominion Government for the fittings for the post office at Yarmouth, N.S.

The offices of C. G. Anderson Lumber Co., Excelsior Life Bldg., Toronto, were recently remodelled and enlarged and the firm now has a fine suite of private offices.

La Fonderie de Ste-Croix Limitee, Ste-Croix, P.Q., have been incorporated to manufacture and deal in machinery for planing mills and woodworking plants. Capital, $20,000.

The Canadian Pulp Machine & Engineering Company, Quebec, Limited, Montreal, have been incorporated to manufacture and deal in all kinds of woodworking machinery.

Haley & Lincoln, 821 Azilda St., Tetraultville, Montreal, are in the market for the following woodworking equipment: Single spindle reversible shaper, swing cut-off saw and one sander.

The Southern Furniture Exhibition which is to be held at High Point, N.C., June 20th to July 2nd, will be staged in the new million dollar Southern Furniture Exposition Building.

C. Guiot, 1230 Christophe Colomb St., Montreal, recently commenced work on a small carriage factory to cost $12,000. The new building is to be two storeys, 64 x 38, of brick construction.

The Board of Education, Hamilton, Ont., are having plans drawn for a new four-storey building to be used as a technical school. This will be equipped with the usual departments.

The workshop and boathouse of L. St. Pierre & Sons, boat builders, P.Q., was recently destroyed by fire. About 200 rowboats went up in flames. The loss is estimated at $12,000 with $2,000 insurance.

The plant and equipment of McIntosh Bros., Bathurst, N.B., was recently offered for sale. The planing mill was acquired by John McIntosh for $15,700, while the sawmill and logs went to E. J. Palmer.

The plant of the Standard Automobile Painting Co., Windsor, Ont., was damaged by fire recently to the extent of $9,000. Several cars which were in the shop at the time, were more or less disfigured.

Hercules Truck Company, Limited, Hamilton, Ont., were recently granted a federal charter to acquire the business known as Hercules Truck Company, and to manufacture and deal in carriages, trucks, aeroplanes and other vehicles. Capital, $100,000. William Kerr and E. S. Kerr, manufacturers, both of Hamilton, Ont., are two of the incorporators.

The Thornton Smith Co., Toronto, dealers and makers of period furniture, are building a handsome store at 342-46 Yonge St. This building is an imposing structure, with a distinctive front in white stone.

Walter Thomas of Eureka, Cal., is considering equipping a plant at New Westminster, B.C., to make fuel from wood waste. At the present time he is manufacturing this fuel in California on a commercial scale.

It may be of interest to note that the first auto to be built in Canada was made by A. J. Frost of Owen Sound. This was of his own design and travelled 18 miles an hour, giving 35 miles to the gallon of gasoline.

Electric Refrigerators, Limited, Toronto, were recently incorporated to manufacture and deal in refrigerators. Capital, $40,000. F. C. Carter and R. L. Kellock, solicitors, both of Toronto, are two of the incorporators.

Another Government steamer, the "Canadian Coaster," was recently launched from the Kingston yard of the Collingwood Shipbuilding Co., Ltd. This vessel will be added to the Canadian Government merchant marine.

M. A. Bradshaw, Limited, Montreal, have been incorporated to manufacture and deal in boxes and other wooden containers. Capital, $49,000. F. B. Common and F. G. Bush, both of Montreal, are two of the incorporators.

National Handles, Limited, Toronto, Ont., were recently incorporated to manufacture and deal in handles and wood turnings. Capital, $40,000. E. E. Williams and D. E. Rogerson, both of Toronto, are two of the incorporators.

G. O. Calvert of Twickenham, England, claims to have evolved a process for the manufacture of synthetic alcohol on a commercial scale. It is claimed that under this method the alcohol can be produced and sold at about $100 a ton.

R. G. Dryden, who operates a planing mill at Toronto, Ont., has purchased a site for a lumber yard at Mount Denis, Ont. The new operation will be in charge of James Nash. The business in Toronto will be carried on as heretofore.

The Chesley Furniture Co., Limited, Chesley, Ont., manufacturers of twin pedestal tables, are putting a new extension table on the market in the shape of a four-post table. This is being manufactured in the different period designs.

International Toy Company, Limited, Montreal, was recently incorporated to manufacture and deal in toys and other wood products. Capital, $50,000. Two of the incorporators are A. A. Magee and T. B. Heney, both of Montreal.

A. Amiot, Limited, Montreal, were recently incorporated to manufacture and deal in pianos, phonographs and other musical instruments. Capital, $200,000. Two of the incorporators are Aime Amiot and Armand Amiot, both of Montreal.

R. H. Hamlin, general manager of the Empire Sash & Door Co., Winnipeg, Man., has been elected director of the Western Life Assurance Co. Mr. Hamlin has been very active in the civic and business life of Winnipeg for a number of years.

Read Motors, Limited, Three Rivers, P.Q., have been incorporated to manufacture and deal in automobiles, boats, aeroplanes and vehicles of all kinds. Capital, $199,000. Two of the incorporators are F. B. Common and F. G. Bush, both of Montreal.

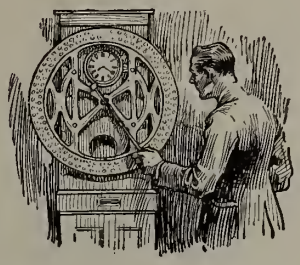
George H. Savage and Alex. King of Duncan, B.C., are opening a modern sash and door factory under the title of "The Cowichan Joinery Works." Millwork of all kinds will be undertaken and special attention given to stair work and interior finish.

Robinson Motor Car Company, Limited, Montreal, have been incorporated to manufacture and deal in carriages, car bodies and other wood products. Capital, $50,000. W. K. McKeown and L. C. Herdman, both of Montreal, are two of the incorporators.

The Department of Soldiers' Civil Re-establishment at St. John, N.B., are equipping a workshop. Present plans call for the installation of equipment to manufacture berry boxes, crates and other wood products in addition to tools and several lines in metal.

The Gulf Transportation Company, Limited, Quebec, P.Q., has been incorporated to manufacture and deal in steamboats, tugs and other craft. Capital, $50,000. Among the incorporators are C. E. Taschereau and J. P. Cantin, both of Quebec, P.Q.

The Anglo-American Auto Co., Room 1504, Royal Bank Bldg., Toronto, have purchased a site at Mimico, Ont., on



Straws
— show the way the wind blows

The following list of users of the INTERNATIONAL TIME and INTERNATIONAL JOB TIME RECORDERS, many of whom have added to their equipment since their initial installation, speaks more for their utility, efficiency and accuracy than many words could tell. Ask ANY of them.

McLagan Furniture Company, Ltd.	Stratford, Ont.
Stratford Chair Company	Stratford, Ont.
Knechtel Furniture Company	Hanover, Ont.
Peppler Bros., Ltd.	Hanover, Ont
Hespeler Furniture Company	Hespeler, Ont.
Crown Furniture Company, Ltd.	Preston, Ont.
Jacques Furniture Company	Kitchener, Ont.
Laidlaw Lumber Company	Toronto, Ont.
J. R. Booth	Ottawa, Ont.
Schultz Bros.	Brantford, Ont.
T. H. Hancock	Toronto, Ont.
Goderich Manufacturing Company	Goderich, Ont.
Keenan Wooden Ware Mfg. Co.	Owen Sound, Ont.
Wm. Cane & Sons, Company, Ltd.	Newmarket, Ont.
Dominion Mahogany & Veneer Co.	Montreal, Que.
J. R. Eaton & Sons, Ltd.	Orillia, Ont.
Elmira Interior Hardwood Co.	Elmira, Ont.
Western Planing Mill	Calgary, Alta.
Canadian Woodworking Company	Yarmouth, N.S.

and many others.

If so many successful wood-products manufacturers are using them to regulate their labor costs, keep their employees satisfied and increase their production, why not you? You owe it to yourself, your business and your employees to investigate.

International Business Machines Co.
LIMITED

F. E. MUTTON, Vice-President and General Manager

Head Office and Factory: 300-350 Campbell Avenue, Toronto

HALIFAX, 44 Granville St. ST. JOHN, 18 Germain St. QUEBEC, 506 Merger Bldg. MONTREAL, 1 and 3 Notre Dame St. OTTAWA, 190 Queen St. TORONTO, 409½ Yonge St. HAMILTON, 228 King St. E. LONDON, 289 Richmond St. WALKERVILLE, 44 Lincoln Rd. WINNIPEG, 227 McDermott Ave. VANCOUVER, 110 Water St.

Also manufacturers of International Dayton Scales and International Electric Tabulators

which they propose to erect a $500,000 automobile factory. The owners have not decided on the date when construction work will be commenced.

The staff of the R. A. Laidlaw Lumber Co., lumber dealers and woodworkers, Toronto, held a very enjoyable at home for their present and former employees. This was the first re-union which has been held in a number of years. A most enjoyable time was had by all.

The Lucknow Table Company, (Private) Limited, Lucknow, Ont., was recently granted incorporation to conduct a general furniture manufacturing business. Capital, $125,000. J. Button and G. T. Aitchison, manufacturers, both of Lucknow, Ont., are two of the incorporators.

La Compagnie Bernier & Dufour, Limitee, St. Benoit, P. Q., have been incorporated to manufacture furniture, musical instruments and other articles of wood. Capital, $49,000. J. Dufour, St. Moise, P.Q., and J. A. Dufour, Mont Jo'i, P.Q., are two of the incorporators.

The match splint factory at Pembroke, Ont., which is part of the $5,000,000 match factory to be erected by the firm of McGuire, Patterson & Palmer, was recently put in operation. In the meantime plans for the construction of the main plant are being held in abeyance.

The Canada Machinery Corporation of Galt, Ont., have closed out their Brock Ave. showrooms and warehouse and have moved their Toronto sales office to Rooms 721-22 Bank of Hamilton Building. W. J. Irving will continue in charge of the Toronto sales force, as heretofore.

A slight blaze occurred in the boiler room of the furniture plant of Malcolm & Hill, Kitchener, Ont., but was extinguished before much damage was done. The fire was caused by the explosion of gas in the furnace, which blew open the doors and set fire to the boiler and engine room.

The fruit growers of the Niagara Peninsula have decided to go ahead with the basket factory which they propose erecting at Niagara-on-the-Lake. Certain concessions have been granted the company by the town and it is anticipated that the work will be undertaken in the near future.

The Coffield Washer Company of Canada, Limited, Hamilton, Ont., were recently incorporated to manufacture and deal in washing machines, wringers and other household appliances. Capital, $50,000. Two of the incorporators are H. Bloom and W. C. Brittain, engineers, both of Hamilton, Ont.

An organization was recently formed by the employees of the North American Furniture Co. Limited, Owen Sound, Ont., along co-operative lines, for the purpose of securing lower prices on foods, clothing, etc., by buying as an Association from the local stores which will give them the lowest prices.

The Dominion Forest Products Laboratory, Vancouver, B.C., is adding a 300,000 lb. testing machine to its equipment. This will make the third lumber testing machine to be installed in this laboratory. The other two machines comprise an Olson 30,000 lb. testing machine and a Hart-Turner impact machine.

The Technical School Commission of St. Hyacinthe, P.Q., have had plans drawn for a technical school to cost $100,000. Tenders will be called for the erection of this building in the near future. A quantity of special furniture will be required for this school and separate tenders are to be called for this work.

The ratepayers of Southampton, Ont., recently passed a by-law guaranteeing the bonds of Panels Limited to the extent of $20,000. This money is to be used by the company in enlarging their factory and installing equipment for the manufacture of patent veneer rim-bound table tops and other built-up products.

Everett & Son of Waukegan, Ill., are moving their plant to Sault Ste. Marie, Ont. They manufacture a line of woodenware of different kinds. An inquiry was recently received from this firm by the Vancouver Board of Trade, stating that they are in the market for sufficient western pine to make 30,000 ironing table tops.

Wattman Car Bodies, Limited, Toronto, was recently incorporated to take over the William H. Wattman Car Body Company and to manufacture and deal in automobile bodies, carriage bodies, furniture and other wooden products. Capital, $50,000. Two of the incorporators are C. H. Weir and E. G. Black, barristers, both of Toronto.

The Collingwood Shipbuilding Co., Limited, Collingwood, Ont., recently held their annual meeting at which officials were elected for the coming year. The following comprise the personel: President, H. B. Smith; vice-presidents, J. W. Norcross and R. N. Wolvin; directors, H. W. Cowan; F. S. Izzard; S. Dyment; J. S. Leitch and S. H. Lindsay, secretary-treasurer.

La Compagnie P. T. Lagare, Limited, Montreal, P.Q., was recently incorporated with a capital of $5,000,000 to take over the interests of P. T. Lagare, Limited. This reorganization is said to affect the parent company only. Other subsidiary firms of the Lagare interests include the Star Phonograph Co. of Quebec, the Dominion Carriage Co., and the Lagare Automobile & Supply Co.

The National Association of Upholstered Furniture Manufacturers will hold their annual meeting at White Sulphur Springs, West Virginia, on April 27th and 28th. Owing to the unsettled conditions which prevail, an unusual amount of interest is being taken in this gathering and a large number of reservations have been made. It is anticipated that the attendance will be unusually large.

The Second Annual Safety Convention will be held at the King Edward Hotel, Toronto, on April 27th and 28th. A number of papers of interest to employers of labor will be presented, dealing with such subjects as "How to Interest the Employee in Safety," "Workmen's Compensation," "Falls and Falling Objects," and "Safeguarding Machinery," etc. In all a very interesting program has been arranged.

J. R. Eaton & Sons, Limited, of Orillia, Ont., are now operating under a federal charter. The change from provincial to federal charter was made some time ago as the firm found that it would be more practical for them to be incorporated under a Dominion charter as they sell their products in all of the provinces. The move has not meant any re-organization, but simply expansion and increased production.

The annual meeting of the Office Furniture & Supplies Co., Limited, Brockville, Ont., was held recently. The following are the officers and directors elected for the ensuing year: T. Sisman, Aurora, Ont., president; W. H. Comstock, Brockville, vice-president; H. K. Bowes, Brockville, managing-director; and G. W. Fowler, Ottawa, Capt. McVittie, Toronto, J. G. Gardner and W. B. Reynolds, Brockville, directors.

The large manufacturing plant which Knox Bros., Limited, Montreal, recently acquired at Levis, P.Q., has been put into operation. In this plant the company have one of the best-equipped working plants in Eastern Canada. The equipment is thoroughly modern and up-to-date, and includes a number of Yates high speed matchers. This plant will be devoted largely to milling in transit, dressing stock and the production of mouldings and finish.

Oil for heating purposes is probably a new development in the woodworking field. The LePage Individual Communion Cup Co. of Toronto, manufacturers of the LePage Silvertone Phonograph, recently discarded their coal heating plant, replacing it with an oil system. This makes a very economical installation as not only does the fuel cost less but the services of a stoker are dispensed with and the storage space, formerly required with coal, is available for other purposes.

The Service Motor Truck Co. of Wabash, Ind., who recently acquired a factory site at London, Ont., at a cost of $50,000 have notified the Chamber of Commerce, London, that construction work on their new plant will begin some time in June. The plans call for three buildings, 110 x 300 feet, together with a power house. It is expected that several hundred men will be employed by autumn. This new factory is intended to take care of both the Canadian and British export business.

W. R. Smith, formerly of the firm of O. & W. R. Smith and Ivan Welsh, who have been running the Royce Ave. Planing Mills, Toronto, have formed a partnership under the name of Smith & Welsh and taken over the premises and storehouse of the Yonge St. Lumber Co., 2219 Yonge St., Toronto, which yards have been closed for some years. Smith & Welsh have stocked and re-opened the lumber yard and will eventually move the machinery from their Royce Ave. plant to their new location.

At the annual meeting of the Victoria Builders' Exchange, held recently in Victoria, B.C., it was predicted that the coming spring would see the commencement of a building boom. Drastic cuts in the price of paints, oils, plumbers' supplies, lumber and glass would, it was maintained, stimulate construction of all kinds. Last year the total permits issued amounted to $1,207,572, as against $526,141 for 1919. House-building was confined largely to small dwellings, built under the Soldiers' Housing Scheme.

Henry Ford, the well-known Detroit automobile manufacturer is very optimistic with regard to the immediate

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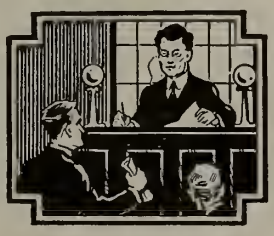
MEMPHIS
SOUTHERN HARDWOOD LUMBER & VENEER

"The works of a man are his mark of achievement"



We rest our case on a long, proud record

THE accumulated evidence of basically superior hardwood lumber and veneers, well manufactured and marketed efficiently, fairly and obligingly, over a period of many years, has given us a standing among the wood-using industries in which it is not vanity to be proud. Our methods and product are the kind that build up business traditions and a list of customers who are friends and remain faithful year after year. Come to us for your requirements in southern hardwoods, lumber, veneers and ply wood, and test the evidence of our perfect service.

THE ANDERSON-TULLY COMPANY
MEMPHIS

HIGH GRADE QUARTERED OAK AND SOUTHERN HARDWOODS ~ VENEERS AND PLYWOOD

future. He states that indications are everywhere manifest that the bottom of the business depression has been reached and that the trend of industry is now definitely upward. Also that his company had received orders for 80,000 cars during March and that 90,000 were booked for April delivery. He felt that the time would not be far away when this mammoth plant would be running at full capacity.

Fuller Brush Company, Limited, Hamilton, Ont., have been incorporated to manufacture and deal in brushes, mops and other wooden articles. Capital, $50,000. C. V. Langs and G. V. Binkley, barristers, both of Hamilton, Ont., are two of the incorporators. This is a branch of the Fuller Brush Co., Hartford, Conn. A plant is to be installed at Hamilton, Ont. It is expected that manufacturing operations will be in full swing by fall. At the start about 100 men will be employed but this number will be rapidly increased.

The Port Hope Veneer Factory, Port Hope, Ont., is preparing for a busy season. They are devoting their attention largely to the manufacture of fruit and berry baskets and are cutting a large quantity of stock in advance. This firm was reeently re-organized with Bert Janes as manager and Mr. Cornfoot as superintendent. The cloudburst and flood which recently visited Port Hope and vicinity, carried away some logs and a quantity of basket bottoms which were being air-dried, but did not interfere with the operation of the plant.

The Inside Woodworkers' and Factory Workers' Union of Ottawa are making new demands upon their employers. The increase asked for amounts to 15c per hour, and would bring the rate up to 75c an hour for inside men and 45c an hour for outside workers. It would appear as if the Ottawa workers are very ill-advised in making this demand at the present moment as conditions do not warrant an increase in wages, and business is such that the plants could be operated with greatly reduced staffs and at reduced time and still keep up with the demand.

A framed picture of an exceptionally fine inlaid table was recently presented to the Bytown Museum, Ottawa. This table, which is the work of the late J. A. B. Hannum, shows a bird's eye view of the well-known E. B. Eddy plant as it stood in 1870, and is considered to be a wonderful piece of work. The table top contains over 100,000 separate pieces of wood of 19 different varieties. The shades of the different species are used to outline and give the dark and light effects. It took Mr. Hannum five years, working during his spare time, to complete this piece. The table is oval-shaped and stands on a carved solid pedestal.

Giddings, Limited, of Granby, P.Q., report that a fairly satisfactory volume of business is offering. The plant is housed in a large five-storey building having a floor space of 3,800 feet and gives employment to about 100 hands. From 8,000 to 10,000 chairs are manufactured each month, while the output of baby carriages is between 5,000 and 6,000 annually. A considerable amount of export is done, many of their baby carriages going to the West Indies, while about 60 per cent. of the cane and wood-seated chairs are shipped to New Zealand and South Africa. The officials of the company are Herbert Giddings, president; W. F. Giddings, vice-president; O. B. Giddings, secretary-treasurer and Chas. Wilson, factory manager.

A merger was recently concluded between the well-known chair manufacturing firm of Heywood Bros. & Wakefield Co. of New Jersey, and the Lloyd Mfg. Co., of Menominee, Mich., the patentees of the Lloyd loom and manufacturers of machine woven fibre furniture and baby carriages. The amalgamated company has been incorporated as Heywood-Wakefield Co., of Massachusettes. The business of the Lloyd Mfg. Co. will be carried on as usual, as the reorganization does not mean any change in policy or sales plans. Marshall B. Lloyd, who is president of the Menominee firm has been added to the directorate of the Heywood-Wakefield Co. and will continue to act as manager of the Menominee plant. The Heywood-Wakefield Co. has been capitalized at $13,000,000.

Personal

F. T. Cliff of the B.C. Manufacturing Co., Limited, New Westminster, B.C., box manufacturers, visited Toronto and Montreal recently while east on a business trip.

H. L. Pease has been appointed secretary of the National Association of Box Manufacturers to succeed W. D. Burr who resigned recently. Mr. Burr has accepted a position with the Chicago Mill & Lumber Co. of Chicago.

J. R. Kennedy, formerly manager of the Port Hope Lumber & Veneer Co., has been appointed representative of the Freiberg Mahogany Co. of Cincinnati and New Orleans. He will handle their line in Canada and the eastern part of New York state.

T. E. McKenzie of the Seaman, Kent Co., Limited, Toronto, left recently for Winnipeg where he will hold demonstrations showing the possibilities of hardwood flooring. These will be held in connection with the building material exposition which is being held in that city.

George Dixon, an employee of the St. Mary's Wood Specialty Co., St. Mary's, Ont., met with an accident recently in the plant of this company. While attempting to replace a belt on a saw pulley, his left hand became caught in the rapidly-moving belt, with the result that his arm was fractured and dislocated at the elbow.

W. W. Butler, president of the Canada Car & Foundry Co., Limited, Montreal, left for England recently in an endeavor to secure some large orders from two British concerns. Owing to the fact that the Canadian railways are not purchasing new equipment, this business is needed to keep the shops of the company operating.

Charles C. Dickenson, vice-president and general manager of E. Sondheimer Co., of Memphis, Tenn., sailed on the "Celtic" from New York on April 2nd, for an extended European trip. Mr. Dickinson will visit England, Scotland, France, Belgium, Italy and Holland, to study the hardwood lumber markets and general conditions in those countries.

W. J. Egan, Canadian Trade Commissioner to South Africa, recently returned from a trip to West Africa where he had been investigating the trade possibilities for the Canadian Government. Mr. Egan visited Algeria and the Gold Coast colonies and found that both these countries offer a market for Canadian goods. At a later date it is probable that a trade commissioner will be appointed to act in this field.

Obituary

N. Beneteau recently passed away at his home in London, Ont. Mr. Beneteau conducted a large carriage factory in London some 15 years ago.

J. Smythe Kerr recently passed away at his home in Ingersoll, Ont. Mr. Kerr had been a life-long resident of that town where he for many years conducted a carriage factory.

G. J. Foote recently passed away at his home in Owen Sound. Mr. Foote had been foreman finisher for the North American Furniture Co., Limited, for the past seven years. He was very popular in sporting circles and managed the North American Furniture Company's baseball team, which won the Owen Sound championship last season.

P. H. Yawman, president of the Office Specialty Mfg. Co., Limited, Newmarket, died recently at Rochester, N.Y. As a mark of respect, the factory, head office and branch stores throughout Canada were closed for two days. Mr. Yawman was of an inventive turn of mind and was responsible for many of the improvements and refinements to office equipment which have tended to revolutionize this industry.

Catalogues, Pamphlets, Etc.

A number of interesting pamphlets have been issued recently by the British Aluminium Co., Limited, 263 Adelaide St. W., Toronto. These are four in number and are entitled; "Aluminium in the foundry," "Aluminium spinning and press work," "Aluminium machine shop practice" and "Aluminium finishing processes."

The National Association of Cost Accountants has just issued as Volume II No. 10 of its official publications, "A Bibliography of Cost Books." This bibliography probably contains the most complete list of cost books which has been published in this country. It is limited to books, it being the intention to cover pamphlets and other material in a supplementary bibliography to be issued later. The bibliography is divided into five sections—one containing books devoted to the general field of costs; one to books on accounting and auditing which contain sections dealing with costs; one to books on industrial engineering with sections on costs; one to books on costs for particular industries, this section being divided into the leading industries; and one dealing with special phases of cost accounting, such as overhead, depreciation, etc. In all, about three hundred and fifty titles are listed. Copies of this volume may be secured from the National Association of Cost Accountants, Woolworth Building, New York. Price 75 cents.

One reason why our Gum is Straight and Flat

Super Hardwoods

In all lines of business, we find the product of some one or two manufacturers excelling that of all others engaged in the same line of business.

Such excellence is usually the result of painstaking care, close attention to details, and a sincere desire to best serve the interests of the ultimate consumer.

We wish we could take every user of hardwoods through our operations, show them the difference between the methods we employ and those in general use, the extreme care that is exercised, the resulting difference in the quality and dependability of the product.

It is not by chance that a "quality product" is created. It is the fruit of honesty, thoroughness and hard work.

KRAETZER-CURED Gum; the only kind that is BRIGHT, STRAIGHT and FLAT.

Oak, Ash, Tupelo and Cypress of the very best.

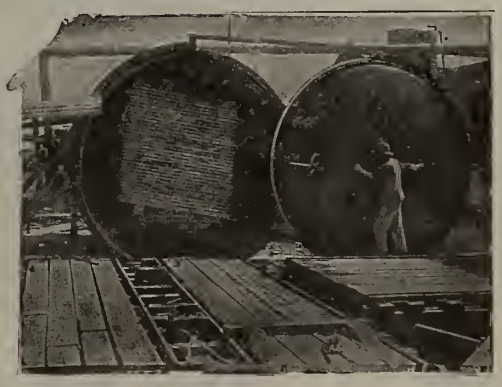
Every board bears our brand.

Our protection THE KRAETZER-CURED LUMBER CO. *Your guarantee*

The Kraetzer-Cured Lumber Co.

GENERAL OFFICE: GREENWOOD, MISS.

Band Mills: Greenwood, Miss., Moorhead, Miss.



Why our Gum does not stain

Our Quartered and Plain Red and White Oak, Ash, Hickory, Red Gum and Tupelo are as fine as the highest quality of virgin timber and thorough knowledge of production can produce. THERE IS NONE BETTER.

Business is on the Upturn

A Message from the Associated Advertising Clubs of the World

Business in Canada is getting its stride again.

It is going to set a steady pace it can keep. Swing along with it—the best is yet to come.

Recent months have marked a return to normal habits and wholesome standards. Business houses are in training to conserve strength and build up vital powers on a better, broader basis.

Prices have reached or are reaching stable levels.

Goods and services no longer sell themselves. They must be sold.

Good salesmanship is the order of the day. It is a help-the-buyer kind. It puts service on a par with profit. Its aim is to attract buyers by making buying attractive.

Merchants and all sellers are not merely getting business—they are building it on foundations of integrity.

Just recently the president of a national business spent thousands of dollars to apologize to the public for mis-statements in advertising published in hundreds of newspapers by his company.

He said policies of truth-telling and fair treatment must be maintained by his company at any cost, because he valued the confidence of the public and the good will of his business too much to have it impaired by wrong practices.

Legitimate business believes in "playing fair" and "dealing square." It aims to safeguard the interests of the purchaser in all transactions.

With the spirit of service as a guiding force, business is worthy of your faith on which its activity relies. There is the nub of the whole matter.

Canadian security lies not only in our mines, forests, factories and farms, but also in the work of our hands and the confidence in our hearts.

Let us turn these to constructive purposes, and enjoy a wholesome measure of prosperity.

Tool for Picking Up Nails

In crafts that call for rapid driving of nails, as in box making, much time is wasted getting the nails from the container and arranging them heads up. A patented tool now on the market is made like a small rake, with long, sharp-pointed teeth so spaced that the nails hang between them by the heads. When this is thrust into the container and shaken, it brings up its load of nails in position to be grasped by the worker's left hand, ready for driving, and saves his fingers from possible injury by the points.—Popular Mechanics.

Added impetus is given to the "Made-in-Canada" propaganda by the fact that the people of Canada paid $100,000,000 in exchange during 1920 on goods purchased in the United States. No value was received for this vast expenditure. By purchasing Canadian-made products, the housewives and buying public of Canada are providing steady employment for their men folk at remunerative wages.

Don't wait until the foreman loses his temper and is on the verge of discharging you before you take an interest in your work.

This picture shows Eighth Class C

Sidman Lumber Curing Kilns

At the Hanover, Ont., Plant of

The Knechtel Furniture Company, Ltd.

It also shows the Kiln Boiler house, and the covered Transfer Tracks between the two rows of kilns.

This Company also has our kilns in their plants at Southampton and Walkerton, each of different design to suit the conditions.

THE SIDMANS of CANADA

LONDON THE S.I.D.M.A.N.S. L.C.K. Reg Trade Mark **ONTARIO**

IN TRANSIT YARD
TORONTO

Million Feet Bone Dry Hardwoods

Orders can be filled immediately

PHONE MAIN 210

705 Excelsior Life Building, Toronto

Anderson-Miller Lumber Co., Limited

H. W. PETRIE LIMITED

CANADA'S DEPENDABLE
MACHINERY and
SUPPLY HOUSE

NEW AND USED
WOODWORKING MACHINERY

Let us Quote on Your Requirements

131-147 FRONT STREET WEST TORONTO

HAMILTON OFFICE: 4 KING STREET WEST

General Woodworking Trade Mart

Quick Action Section

Equipment Materials Employment

MACHINERY
For Sale

At Meaford, Ont.

One Berlin Circular Resaw No. 261, in first class condition.
One Car Pulley.
One American Trim Saw. This machine is all iron and countershaft attached to machine. The saw travels forward by means of a foot lever.
One Sherman Trim Saw. A light compact machine suitable for small stock; machine in good condition.
Two American 12" Scrapers with extra blocks.

At Ste. Agathe Factory

One Whitney 15" Scraper, with extra blocks.
One Large Circular Saw Grinder, with handle. Saws up to 36" dia.; machine in good condition.
One American Slat Ripping Machine.
One Berlin Circular Resaw No. 261. The machine is as good as new.

At West Lorne Factory

S. A. Woods 12" Inside Moulder No. 107; practically new; a large quantity of moulding knives along with the machine.
Two Canada Machinery Co. Lighting Cut Off Saws No. 638, practically new.
One Sherman End Matcher, with extra pair of heads.
One Car Pulley.
One S. A. Woods Outside Moulder No. 131. This machine was purchased from S. A. Woods last July and is as good as new.
One American Double Surfacer No. 15. This is a heavy machine equipped with thin high speed knife cylinders 30" knives, broken rolls.
One Sawyer Massey Portable Saw Mill, saw frame and carriage 52" inserted tooth saw and friction feed, carriage is fitted with three heads, left hand mill.
One American Scraper Knife Grinder.
One No. 7 Sturtevant Forge Blower, in good order.
One Double Emery Wheel Stand.
One American, Self Feeding Rip Saw.

At Toronto, Ont.

One Canadian General Electric Generator 35 K.W.D.C. on adjustable No. 8241. Class 6-35-1150. Form B. Volts 120 no load. 125 full load, amperes 280, revolutions 1150 in good condition.
One Canadian General Electric 24 x 80 x 2" Blue Vermont Marble Switch Board (H.E.N. 12933) Type C/D G&F 80 amperes, 350 volts, 125 or 1½" pipe frame and mounted as follows:
One R.P. Volt Meter 0 to 140 volts.
One R.P. Ammeter 0 to 400 amps.
One Pilot Light brass goose neck.
10-35 Amperes Double Pole, single throw knife switches with enclosed fuses.
One 350 Amperes ditto.
One 60 Amperes ditto.
One 30 Amperes ditto.
One Steam Duplex Pump 12 x 9 x 9½" in good condition.
Two Whitney Scrapers 15" in good condition.
One American Scraper 12" in good condition.
One Brown Handle Boring and Chucking Machine.
One Bartlett Shaving Hogg.
One American Scraper Knife Grinder without countershaft.
One 12" Peerless Belt Lacing Machine in good repair.
One Shimer & Sons of Milton, Pa. Hand Box Matcher in splendid condition.

Please address replies to
THE SEAMAN KENT CO., LTD.,
263 Wallace Ave., Toronto.

Business Opportunity

WANTED, manufacturers in Manitoba, Quebec and Ontario to make and market a domestic utility article in woodenware, on a royalty basis. Exclusive territory. Patent applied for in Canada, U.S.A. and Europe. Address, Price Manufacturing Co., 3471 S. Street, Maywood, Victoria, B.C.

I Offer the following

Used Machines

For Immediate Shipment

Subject to prior sale

Moulder, Hermance 10" 4 Side.
Moulder, American 10" 4 Side.
Moulder, H. B. Smith 4" 4 Side.
Sander, Berlin 36" 2 Drum.
Sander, 60" Columbia 3 Drum.
Sander, 48" H. B. Smith 3 Drum Endless Bed.
Belt Sander, Curtis No. 20.
Edge Sander, Duplex Double Belt.
Belt Sander, Moore 6" Double Belt.
Scraper, Baxter D. Whitney 42".
Rubbing Machine, Moore Machine Co.
Matcher, No. 229 American Hardwood.
Matcher, American No. 22 24" 4 Side.
Matcher, Woods 24" x 6".
Band Resaw, Mershon 44".
Band Resaw, Connell & Dengler 60".
Band Rip Saw, American No. 1 Roll Feed.
Band Rip Saw, Fay & Egan No. 202 Chain Feed.
Band saw, 36" Tilting Table.
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Box-Board Printer, 18 x 44", F. X. Hooper, two-color, Knocker feed, $975.-00. All kinds Woodworking Machinery for sale.

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Sash, door and planing mill machinery, boilers, engines, motors, pulleys, gears, machine shop and moulding machinery. 8 ft. Linderman glue jointer. Full printed list on request. Cargill Limited, Cargill, Ont. 3-6

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6 Embossing Machine, (Am. Woodworking Machinery Co.)
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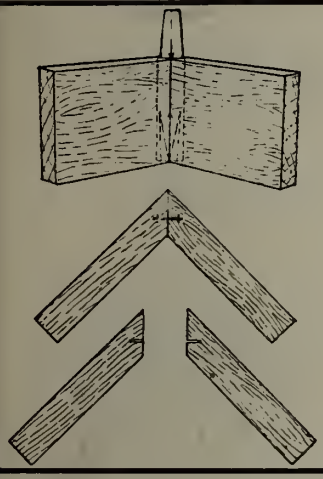
9 Fox Dods Machine 62"
11 Spindle Carver
12 No. 9 Double Disc Sander 24"
14 12 Spindle Dovetailer
19 2-Old Rubbing Machines Maddox Short Belt
23 No. 10-1915 Valley City Special Twist Roping Machine 6'
24 Small Double Mitre Saw for chair seat rails (McG. G.)
25 No. 4 Reynolds Screw Driving Machine, 2 magazines
26 Edge Sander Maddox
31 Steaming & Bending Tank 8 x 48
32 Bending Machines, Chair Back Bender.
33 Double Drum Sander 2-24" x 24 with 42" desk on one end (McG. Gourlay)
34 Double Spindle Oscillating Sander Feed 5/8 & 1 1/8 Spindles (J. Cochrane)
35 Multiple A 10886 Drum Sander 6-12-18-24 diameter 12" (McG. Gourlay)
36 No. 83 Universal 1916 Combination Belt & Spindle Sander.
37 Double Mitre Saw Maddox.

Dry Rot of Timbers

As applied by many persons any decay which is found in wood in a comparatively dry situation is called dry rot. Thus loosely used, the term actually includes all decay in wood, since wood kept sufficiently wet cannot decay. To the pathologist the term dry rot means a certain fungus, (merulius lachrymans,) which gains its distinction from the fact that it is frequently found growing in timbers without any aparent moisture supply. In reality it does not grow without moisture and is as powerless as any other fungus to infect thoroughly dry wood, according to the Forest Products Laboratory. Given moist wood in which to germinate, it is able to make its way a surprisingly long distance in dry timbers, drawing the water it needs from the moist wood through a conduit system of slender minutely porous strands. Wood in the typical advantage stage of dry rot is shrunken, yellow to brown in color, and filled with radial and longitudinal shrinkage cracks, roughly forming cubes. In many instances these cracks are filled with a white felty mass, the interwoven strands of the fungus. The decayed wood is so brittle and friable that it can easily be crushed into powder.

The dry rot fungus is active in nearly every region of this country, United States, and in Europe. It is destructive to factory and house timbers and to logs in storage. Coniferous or soft woods are more commonly infected by it than hardwoods.



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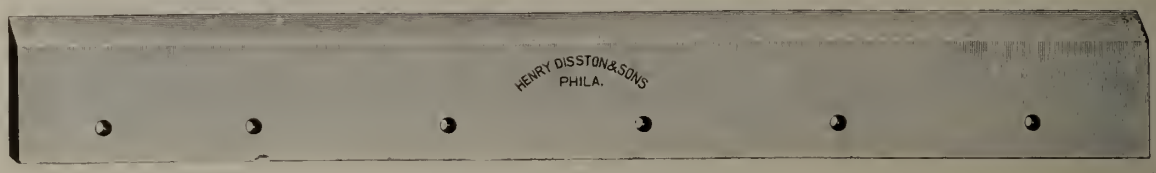

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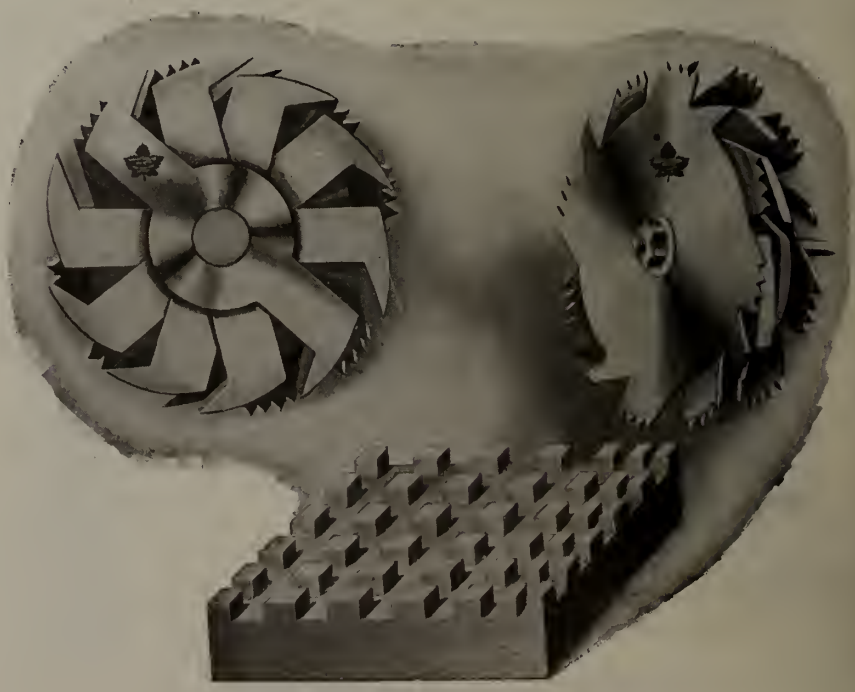

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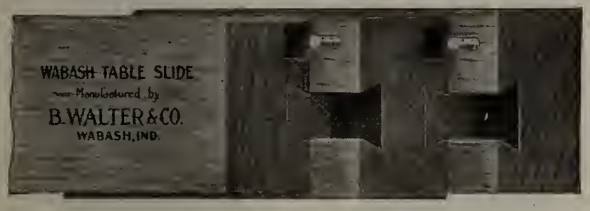

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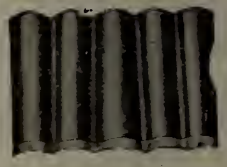
SAW EDGE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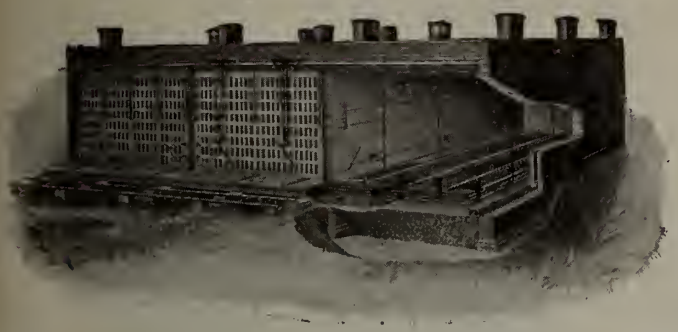

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Cast Brass Leg Sockets

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No.	Opening at Top inches	Height inches
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B808	1¼	1¼
C808	1½	1¼
D808	1¾	1½
E808	2	2
F808	2¼	2¼

Style 814

No.	Opening at Top inches	Height inches
A814	1	⅞
B814	1¼	1
C814	1½	1⅛
D814	1¾	1⅜
E814	2	1½
F814	2⅜	2⅛

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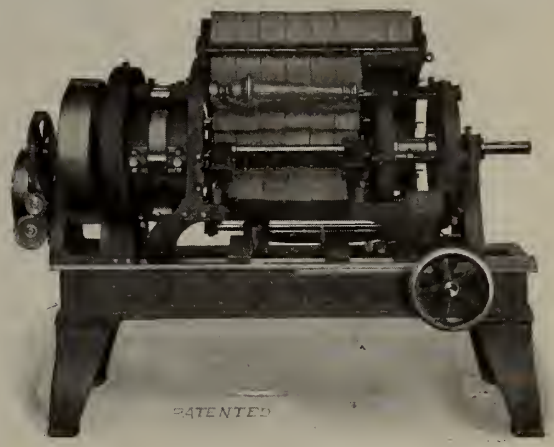

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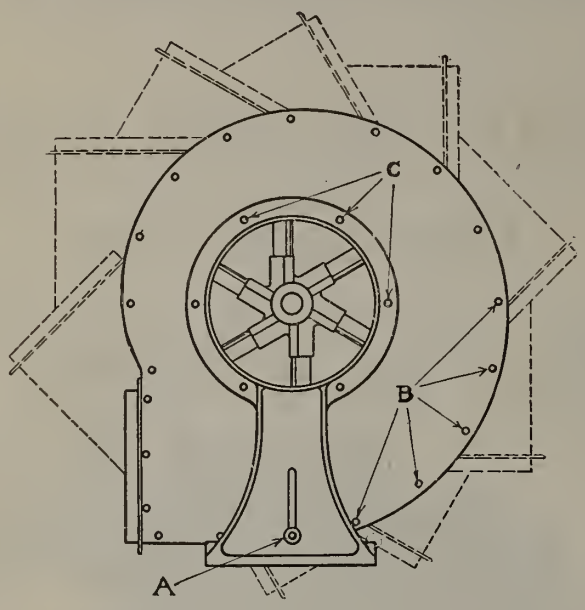

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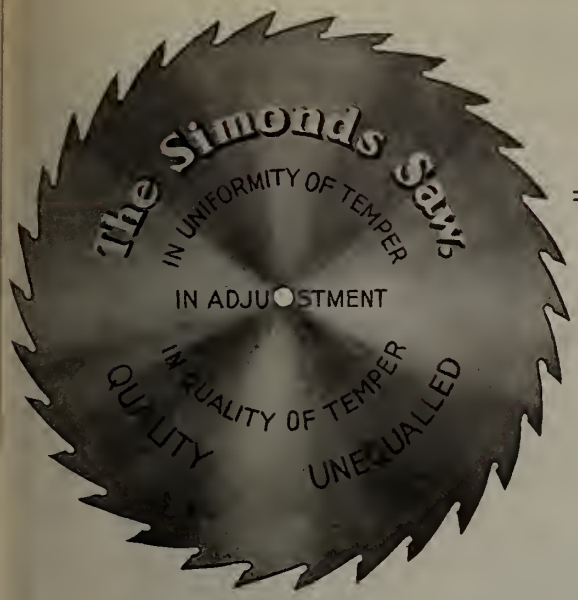

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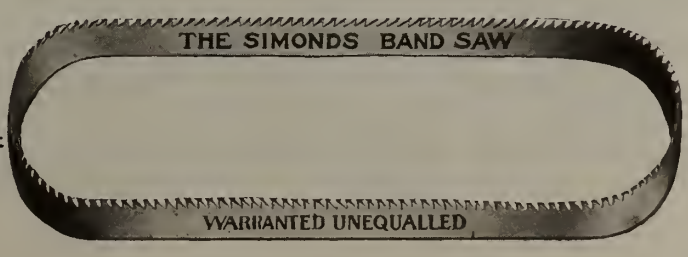

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Williams Machinery Co., A. R., Toronto, Ont.

DOWEL MACHINES
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.

DOWELS
Canada Wood Specialty Co., Ltd., Orillia, Ont.

DRY KILNS
Canadian Blower & Forge Co., Kitchener, Ont
Cutler Desk Co., Buffalo, N. Y.
Curtis-Hosey Dryer Co., Montreal, Que.
Grand Rapids Veneer Works, Grand Rapids Mich.
National Dry Kiln Co., Indianapolis, Ind.
Sidmans, London, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

DUST COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

DUST SEPARATORS
Canadian Blower & Forge Co., Kitchener, Ont.

EDGERS (Single Saw)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.

EDGERS (Gang)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

EDGER SAWS
Atkins & Co., E. C., Indianapolis, Ind.

ELECTRIC SUPPLIES
Northern Electric Co., Montreal, Que.

ENAMELS
Celluloid Zapon Co., New York.

END MATCHING MACHINES
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

EXHAUST FANS
Canadian Blower & Forge Co., Kitchener, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.

EXHAUST SYSTEMS
Canadian Blower & Forge Co.
Neville-Cooper Co., Toronto.

FIBRE CORD
Grand Rapids Fibre Cord Co., Grand Rapids.

FEED ROLLS
Atkins & Co., E. C., Indianapolis, Ind.

FLOORING MACHINES
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

FURNITURE LEATHER
Eagle-Ottawa Leather Co., Grand Haven, Mich.

FURNITURE TRIMMINGS
Foster, Merriam Co., Meriden, Conn.

GARNET PAPER AND CLOTH
Carborundum Co., Niagara Falls, N.Y.
Macdonald, Norman, Toronto, Ont.
Oakey & Sons, Limited, John, London, S.E.I. (Wellington Emery & Black Lead Mills).

GRAINING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Yates Machine Co., P. B., Hamilton, Ont.

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Basswood

1 in., 1¼ in., and 1½ in. Dry Basswood

Dry Birch Stock

We offer in **Birch** and **Maple**
End Stock 1 x 7 in., and wider, 1 x 6 in.

All thicknesses and grades in
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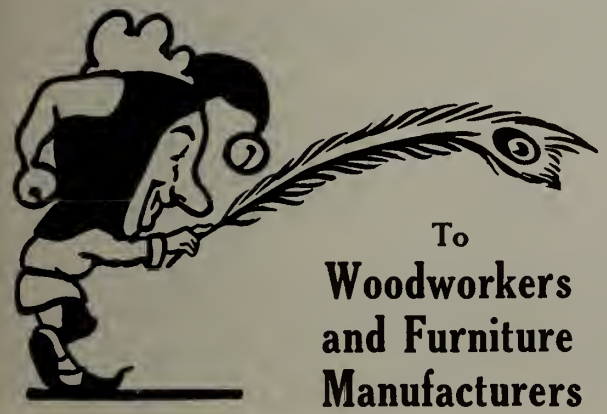

To
Woodworkers and Furniture Manufacturers

Your requirements in Reed Forms for Wicker Work Furniture, Mechanic's Tool Cases, Dowels, Novelties, Cedar Chests, Piano Lamps, Table Lamps, etc., can be promptly supplied by us.

We are always pleased to quote prices and give any information you may desire. Try us on your next order.

THE
Brantford Pattern Works
BRANTFORD

Machinery for Sale

Band Rip Saw, Jackson Cochrane, 42"	$ 300.00
Band Saw, McGregor Gourlay, 34"	200.00
Buzz Planer, Clark Demill, 16"	200.00
Barrel Heading Machine, Rochester, Number of Saws	525.00
Doweling Machine M-31 Cowan No. 2, cap up 2½" 7 heads	400.00
Double Surfacer, C.M.C. No. 212 30" x 12"	1250.00
Drill Press, Perfect 14"	75.00
Elliot Woodworker, No. 4	250.00
Gravity Swing Cut Off Saw, McGregor Gourlay	90.00
Moulder, Cowan 12" 4 Sided	750.00
Moulder, Goldie McCullough 12" 4 Sided	750.00
Moulder, Goldie McCullough 7" 4 Sided	350.00
Moulder, Cowan 7" 3 Sided	250.00
Matcher & Planer, S. A. Woods No. 29 15" x 6"	1600.00
Mortising Machine, McGregor Gourlay	150.00
Presses American Hand Screw Veneer, 3 Screws 38" x 12" Each	60.00
Single Surfacer, 30" x 10"	300.00
Scroll Saw, Goldie McCullough	100.00
Sander, American 36" 3 Drum	750.00
Sander, McGregor Gourlay 48" 3 drum	1250.00
Sander, P. B. Yates 60" 3 Drum	1500.00
Sander, American Double Disc 36" Adjustable Tables	350.00
Sanders, Double and Single Belt, Each	125.00
Scrapers, American 12" Sectional Rolls, Each	250.00
Tenoning Machine, McGregor Gourlay	250.00
Universal Woodworker, McGregor Gourlay	250.00

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67-69 Frederick St., Toronto
TELEPHONE MAIN 2200

"Canadian Woodworker" Buyers' Directory—Continued

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GLUE
Casein Mfg. Company, New York, N.Y.
Casein Glue Mfg. Co., Chicago, Ill.
Perkins Glue Company, South Bend, Ind.
Sampson & White, London, England.

GLUE CLAMPS
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane, & Company, Kitchener.

GLUE HEATERS
Fay & Egan Co., J. A., Cincinnati, Ohio.
International Electric Co., Indianapolis, Ind.
Jackson, Cochrane, & Company, Kitchener.
Pringle, R. E. T., Toronto, Ont.

GLUE JOINTERS
Casey Co., M. E., Montreal, Que.
Jackson, Cochrane & Company, Kitchener, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GLUE SPREADERS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener.

GLUE ROOM EQUIPMENT
Perrin & Company, W. R., Toronto, Ont.

GRINDERS (Cutter)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

GRINDERS (Knife)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDERS (Tool)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GROOVERS
Atkins & Co., E. C., Indianapolis, Ind.

GROOVING HEADS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Mattison Machine Works, Rockford, Ill.

GUM LUMBER
Aberdeen Lumber Co., Pittsburg, Pa.
American Hardwood Lumber Co., St. Louis, Mo.
Anderson-Tully Co., Memphis, Tenn.
Barr-Holaday Lumber Co., Greenfield, Ohio.
Brown & Co., George C., Memphis, Tenn.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Darnell-Love Lumber Co., Leland, Miss.
Gum Lumber Association, Memphis, Tenn.
Hyde Lumber Company, South Bend, Ind.
Merceau-Hawkins Tie Co., Huntington, W.Va.
Paepcke-Leicht Lumber Co., Chicago, Ill.
Sondheimer Co., E., Memphis, Tenn.
Steele & Hibbard Lumber Co., St. Louis, Mo.
Thomas & Proetz Lumber Co., St. Louis, Mo.

HAND SCREWS
Fay & Egan Co., J. A., Cincinnati, Ohio.

HANDLE & SPOKE MACHINERY
Fay & Egan Co., J. A., Cincinnati, Ohio.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Whitney & Son, Baxter D., Winchendon, Mass

HARDWARE
Garden City Plating & Mfg. Co., Chicago.
Laidlaw Bale-Tie Co., Hamilton, Ont.
Weber-Knapp Co., Jamestown, N.Y.

HARDWOOD DIMENSION STOCKS
Brown Bros. & Co., New York.

HARDWOOD LUMBER
American Column & Lumber Co., Columbus, Ohio.
American Hardwood Lumber Co., St. Louis, Mo.
American Oak Mfrs.' Assn., Memphis, Tenn.
American Walnut Association, Washington, D.C.
Anderson Lumber Co., C. G., Toronto, Ont.
Anderson, Shreiner & Mawson, Toronto, Ont.
Anderson-Tully Co., Memphis, Tenn.
Arkla Lumber & Mfg. Co., St. Thomas.
Arrow Lumber Co., Parkersburg, W. Virginia
Atlantic Lumber Company, Toronto, Ont.
Bacon Lumber Co., Cleveland, Ohio.
Banning, Leland G., Cincinnati, Ohio.
Barr- Holaday Lumber Co., Greenfield, Ohio.
Barlett Lumber Co., W. C., Charleston, Va.
Bedna Young Lumber Co., Jackson, Tenn.
Biglow-Cooper Co., Bay City, Mich.
Boland Lumber Co., Grand Rapids, Mich.
Bonner & Sons, J. H., Memphis, Tenn.
Brown Bros. Co., New York.
Brown & Company, Geo. C.
Brown & Hackney, Inc., Memphis, Tenn.
Bruce Co., E. L., Little Rock, Ark.
Burns & Knapp Lbr. Co., Conneautville, Ohio.
Bury & Company, Rohert, Toronto. Ont.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Conkling Lumber Co., Frank A., Memphis, Tenn.
Canadian General Lumber Co., Toronto, Ont.
Chicago Mill and Lumber Co., Chicago, Ill.
Clark & Sons, Edward, Toronto.
Dacus-Richards Hardwood Co., Memphis, Tenn.
Darnell-Love Lumber Co., Leland, Miss.
DeHewit Lumber Co., Huntington, Va.
Dooley Lumber Co., F. T., Memphis, Tenn.
Evansville Band Mill Co., Evansville, Ind.
Frye Lumber & Veneer Co., J. W., Dayton, O.
Gayoso Lumber Co., Memphis, Tenn.
Gill Lumber Co., Chas., Wausau, Wis.
Hall Lumber Co., Thos., Charleston, W.Va.
Hart & McDonagh, Toronto. Ont.
Heeney, Percy E., Kitchener, Ont.
Hunt, Wellington & Smith, Nashville, Tenn.
Hyde Lumber Co., South Bend, Ind.
Johnson Bros., Memphis, Tenn.
Korn-Conkling Co., Cincinnati, Ohio.
Kosse, Shoe & Schleyer Co., Cincinnati, O.
Kraetzer-Cured Lumber Co., Greenwood, Miss.
Lawrence & Co., P. J., St. Louis, Mo.
Leach & Co., J. D., Chicago, Ill.
Liverpool Hardwood Co., New York.
London Lumher Co., London, Ont.
Long-Knight Mfg. Co., Indianapolis, Ind.
Luehrman Hardwood Lbr. Co., St. Louis, Mo.
May Bros., Memphis, Tenn.
McLean Mahogany & Cedar Co., Buffalo, N.Y.
McLennan Lumber Co., Montreal, Que.
Memphis Band Mill Co., Memphis, Tenn.
Mengel Co., Louisville, Ky.
Merceau-Hawkins Tie Co., Huntington, W.Va.
Mowbray & Robinson, Cincinnati, Ohio.
Murrelle Lumber Company, Memphis, Tenn.
Nicholson & Co., E. M., Montreal, Que.
Otis Mfg. Co., New Orleans, La.
Paepcke Leicht Lumber Co., Chicago, Ill.
Pedwell Hardwood Lumber Co., Toronto, Ont.
Perkins Bros., Kelso, Ark.
Peytona Lumber Co., Huntington, W. Va.
Pickrel Walnut Co., St. Louis. Mo.
Powe Lumber Co., Thos. E., St. Louis, Mo
Ritter Lumber Co., W. M., Columbus, Ohio
Rush Lumber Co., Memphis, Tenn.
Sawyer Goodman Co., Marinette, Wis.
Sondheimer Co., E., Memphis, Tenn.
Spencer, C. A., Montreal, Que.
Spotswood & Son, E. R., Lexington, Ky.
Stark & Co., Jas. E., Memphis, Tenn.
Steele & Hibbard Lumber Co., St. Louis, Mo.
Sterrett, Will S., Cincinnati
Stimson Hardwood Co., J. V., Memphis, Tenn.
Tallahatchie Lumber Co., Memphis, Tenn.
Tennessee Lumber & Coal Co., Cincinnati Ohio.
Thompson, Katz Lumber Co., Memphis. Tenn.
Thompson & Co., Lewis, Philadelphia, Pa.
Tustin Hardwood Lumber Co., Memphis, Tenn.
Upham & Walsh, Chicago, Ill.
Utley-Holloway Co., Chicago, Ill.
Warren-Ross Lumber Co., Jamestown, N.Y.
Wheeler-Timlin Lumber Co., Wausau, Wis.
Whiting Co., Wm. S., Johnson City, Tenn.
Wisconsin Lumber Co., Chicago, Ill.
Woodruff Powell Lumber Co., South Bend, Ind.
Wayne Lumber Co., New York
Wood Mosaic Co., Louisville, Ky.
Yellow Poplar Lumber Co., Coal Grove, Ohio.

HYDRAULIC VENEER PRESSES
Perrin & Company, Wm. R., Toronto, Ont.

INSURANCE
Lee Blakemore, Inc., Toronto, Ont.

KNOBS
Waddell Mfg. Co., Grand Rapids, Mich.

JOINTERS
Canada Machinery Corporation, Galt, Ont.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

KNIVES (Planer and others)
Atkins & Co., E. C., Indianapolis, Ind.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

LATHES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Defiance Machine Works, Defiance, Onio.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochane & Company. Kitchener. Ont.
Mattison Machine Works, Rockford. Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie. H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

LEATHER (Artificial)
Fibro Mfg. Company, Beverly, N. J.

LEATHER CLOTH
Zapon Leather Cloth Co., New York.

LUMBER MEASURER
Durant Mfg. Co. Milwaukee, Wis.

MACHINE KNIVES
Atkins & Co., E. C., Indianapolis, Ind.
Canada Machinery Corporation. Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Peter Hay Knife Company, Galt, Ont.
Radcliff Saw Mfg. Co., Toronto. Ont.
Yates Machine Co., P. B., Hamilton, Ont

MIRRORS
Chicago Mirror & Art Glass Co., Chicago, Ill.
Hart Mirror Plate Co., Grand Rapids, Mich.

MITRE SAWS
Atkins & Co., E. C., Indianapolis, Ind.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.

MOTOR TRUCK EXTENSIONS
Swedish Crucible Steel Co., Windsor, Ont.

MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A. Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

NAILS
Laidlaw Bale-Tie Co., Hamilton, Ont.

NAILING MACHINES
Morgan Machine Co., Rochester, N.Y.

OIL
Zero Oil Co., Parkersburg, Pa.

OIL STONE GRINDERS
Mummert-Dixon Co., Hanover, Pa.

PANELS
Algoma Panel Co., Algoma, Wis.
Gorham Bros., Mount Pleasant, Mich.
Hardwood Products Co., Nennah, Wis.
Hay & Co., Woodstock, Ont.
Holden Company, Henry S., Chicago, Ill.
Roberts, Geo. G., Chicago, Ill.
Waetjin & Co., L., Milwaukee, Wis.

PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford. Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Wallace & Co., J. D., Chicago. Ill.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PERIOD MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich.

PERIOD TURNINGS
Decorators Supply Co., Chicago, Ill.
Walter & Sons, J., Kitchener, Ont.

"Pony" Cabinet Clamp

For lightness combined with strength this clamp has no equal. All parts are selected from the best materials obtainable and we have spared no effort to make the "Pony" the finest thing of its kind on the market. Made in sizes to open 18 in. to 72 in.

"Jorgensen"

Peerless Adjustable Hand Clamp

Fits every grip without a slip and takes a tighter hold with less effort. It is a tool of real economy and a clamp that insures efficiency.

Adjustable Clamp Company

216 N. Jefferson St., Chicago, U.S.A.

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Aikenhead Hardware Limited ..... Toronto
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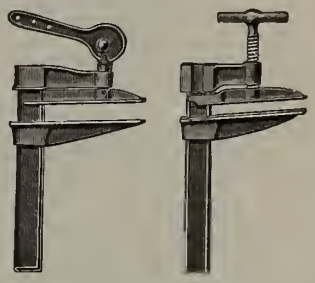
Colt's Clamps

for the

Woodworker



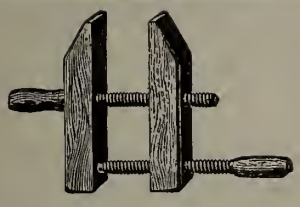
Colt's Universal and Vise Clamps are unsurpassed for the Furniture Manufacturer and General Woodworker. They are made right, both in design and quality of materials and workmanship.

Colt's Clamps are quick-acting and have broad jaw clamping surface.

For further information write for Catalogue No. 294.

Batavia Clamp Co.

235 Centre St. BATAVIA, N. Y.



Cabinet Makers' Benches, Clamps and Hand Screws

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C. CHRISTIANSEN

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Empire All Steel Clamps Reduce Your Scrap Pile

There will be less trouble in your plant if Empire Clamps are used.

These unbreakable all steel clamps are proving their worth in many shops where the operators swear by them.

Try Empire and you will use no other.

We specialize in all types of woodworking tools.

Empire Tool Works

TORONTO

"Canadian Woodworker" Buyers' Directory—Continued

PLANERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLANING MILL MACHINERY
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PORTABLE DRILLS
Wisconsin Electric Co., Wisconsin, U.S.A.

PRESSES (Veneer)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Jackson, Cochrane & Company, Kitchener, Ont.
Perrin & Co., Wm. R., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

REED
Carter & Co., E. T., Toronto, Ont.
Overseas Reed and Cane Co., Ionia, Mich.

REED MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

RESAWS
Atkins & Co., E. C., Indianapolis, Ind.
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

RIM AND FELLOE MACHINERY
Defiance Machine Works, Defiance, Ohio.
Fay & Egan Co., J. A. Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mackenzie Machinery Co., D., Guelph, Ont.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

ROSETTES
Waddell Mfg. Co., Grand Rapids, Mich.

RUBBING MACHINES
DeVilbiss Mfg. Co., Toledo, Ohio.
Mattison Machine Works, Rockford, Ill.

SAFETY DEVICES
Cowan & Company, Galt, Ont.

SANDERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SAND PAPER
Manning Abrasive Company

SASH, DOOR & BLIND MACHINERY
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Elliot Machinery Co., Belleville, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SAWS
Atkins & Co., E. C., Indianapolis, Ind.
Disston & Sons, Henry, Toronto, Ont.
Elliot Machinery Co., Belleville, Ont.
Radcliff Saw Mfg. Company, Toronto, Ont.
Seibert & Co., Louis, Cincinnati, Ohio.
Shurly-Dietrich, Ltd., Galt, Ont
Simonds Canada Saw Co., Montreal, Que.
Wallace & Co., J. D., Chicago, Ill.

SAW BENCH
Wallace & Co., J. D., Chicago, Ill.

SAW SHARPENERS
Hooker & Son, O. V., St. Johnsbury, Vt.

SAW SWAGES
Atkins & Co., E. C., Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Crowel, D. J., Buffalo, N. Y.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Radcliff Saw Mfg. Co., Toronto, Ont.

SAW TABLES
Canada Machinery Corporation, Galt, Ont. ..
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Yates Machine Co., P. B., Hamilton, Ont.

SCRAPING MACHINES
Canada Machinery Corporation, Galt, Ont. ..
Garlock-Walker Machinery Co., Toronto, Ont.
Whitney & Sons, Baxter D., Winchendon, Mass.

SCREW DRIVING MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.
Reynolds Machine Co., Massillon Ohio.

SCROLL SAWS
Atkins & Co., E. C., Indianapolis, Ind.
Canada Machinery Corporation, Galt, Ont. ..
Casey Co., M. E., Montreal, Que.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Jackson, Cochrane, & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamiltonfi Ont.

SECOND-HAND MACHINERY
Casey, M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Osborne Sexton Machinery Co., Columbus, O.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

SHAPERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Sons, Baxter D., Winchendon, Mass
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SHAPER COLLARS
Woodworkers Tool Works Chicago, Ill.

SHAVING COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

STAINS
Ault & Wiborg, Toronto, Ont.
Marietta Pairt & Color Co., Marietta, Ohio.
Shannon Co., Ed. J., Cincinnati, Ohio.
Williams Bros. & Co., Hounslow, Eng.

SINGLE SPINDLE BOXING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

STAVE SAWS
Atkins & Co., E. C., Indianapolis, Ind.

STAVE SAWING MACHINE
Whitney & Son, Baxter D., Winchendon, Mass

STEEL DOOR MATS
Cary Mfg. Company, Brooklyn, N.Y.

SURFACERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Yates Machine Co., P. B., Hamilton, Ont.

SWING SAWS
Atkins & Co., E. C., Indianapolis, Ind.
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Eaglesfield, R. D., Indianapolis, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE LEG LATHES
Fay & Egan Co., J. A., Cincinnati, Ohoa.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE SLIDES
Jefferson Woodworking Co., Louisville, Ky.
Walter & Company, B., Wabash, Ind.

TEMPERATURE REGULATORS
Canadian Powers Regulator Co., Toronto, Ont.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Compan, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TIME CLOCKS
International Business Machines Co., Toronto, Ont.

TOPS
Gorham Bros., Mount Pleasant, Mich.

TRIMMERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Preston Woodworking Machinery Company, Pretson, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TRUCKS
Chapman Ball Bearing Co., Toronto, Ont.
Cowan Truck Company, Toronto, Ont.
National Dry Kiln Co., Indianapolis, Ind.

TURNED WOOD GOODS
Algoma Wood Products Co., Algoma, Wis.
Canada Wood Specialty Co., Orillia, Ont
Esthes & Sons, E. B., New York.

TWINES & WEBBING
Doon Twines, Ltd., Kitchener, Ont.

MORGAN
NAILING MACHINES

Are built strongly for heavy continuous service. Machines adapted to all kinds of special nailing.

Regular machines for all sizes of boxes and crates.

Write us for descriptive literature.

Machines that save money

Morgan Machine Co.

DEPT. A ROCHESTER, N.Y.

Morgan No. 12-30 Open Back Nailing Machine, Fitted with motor.

DO YOU KNOW

THE SIGNODE WAY
IS
THE SENSIBLE WAY
THE SUCCESSFUL WAY
THE SATISFACTORY WAY
OF
STRAPPING YOUR SHOOKS, VENEERS, MOULDINGS, AND BUNDLES OF LUMBER FOR SHIPMENT

LET US SEND YOU FULL DETAILS

SIGNODE SYSTEM, INC.

TORONTO
16 COLBORNE ST.

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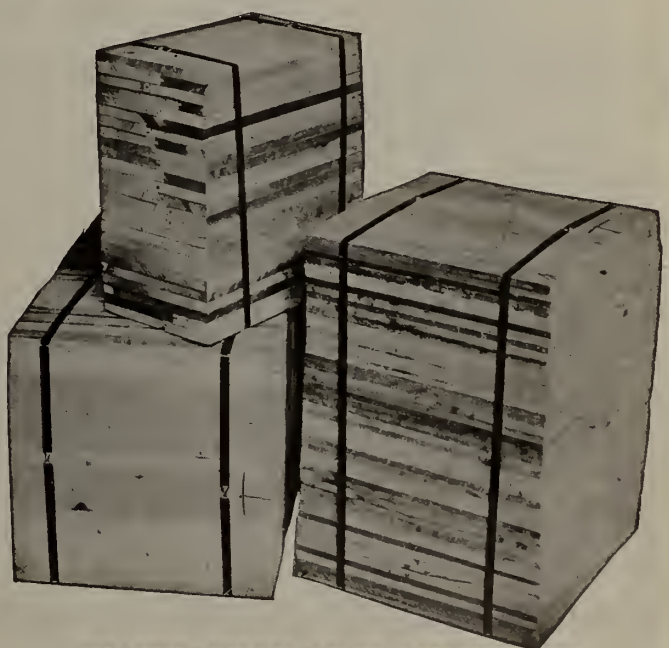
20 ST. NICHOLAS ST.

CHICAGO NEW YORK BOSTON ATLANTA
SAN FRANCISCO



STRAPPED SHOOKS READY FOR SHIPMENT

"Canadian Woodworker" Buyers' Directory—Continued

VARNISHES
Adams & Elting Co., Chicago and Toronto.
Ault & Wiborg Company, Toronto. Ont.
Penfound Varnish Co., Toronto, Ont.

VARNISH DRYERS
Nicholls Co.. A. S., New York, N.Y.

VARNISH SPRAYERS
DeVilbiss Mfg. Co., Toledo, Ohio.
Paasche Air Brush Company, Chicago, Ill.

VENEERS
Batesville Lumber & Veneer Co., Lawrenceburg, Ind.
Birds Eye Veneer Co., Escanaba, Mich.
Bury & Compny, Robert, Toronto, Ont.
Central Lumber Co., Indianapolis, Ind.
Christmann Veneer & Lumber Co., St. Louis, Mo.
Curtis Co., C. E., Chicago
Dean Spicker Company, Chicago, Ill.
Empire Veneer Company, Chicago, Ill.
Evansville Veneer Co., Evansville, Ind.
Freiberg Lumber Co., Cincinnati, Ohio
Frye Lumber & Veneer Co., J. W., Dayton, O.
Guelph Patent Cask Co., Scotstown, Que.
Hartzell, Geo. W., Piqua, Ohio.
Hoffman Bros. Company, Fort Wayne, Ind.
Holden, Henry S., Chicago, Ill.
Hardwood Prudocts Co., Neenah, Wis.
Korn-Conkling Co., Memphis, Tenn.
Long-Knight Lumber Co., Indianapolis, Ind.
Litton Veneer Co., Rockford, Ill.
Memphis Veneer & Lumber Co., Memphis, Tenn.
Mowhawk Veneer Co., Warren, Pa.
Munising Woodenware Co., Munising, Mich.
Nartzik, J. J., Chicago, Ill.
National Veneer & Lumber Co., Indianapolis, Ind.
North Vernon Lumber Co., North Vernon, Ind.
Northwestern Cooperage & Lumber Co., Gladstone, Mich.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod-Jurden Co., Memphis, Tenn.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Veneer Co., New Albany, Ind.
Roberts, Geo. G., Chicago, Ill.
Southern Veneer Mfg. Co., Louisville, Ky.
Stimson Veneer & Lumber Co., Memphis, Tenn.
Sturm Co., Adolph, Chicago, Ill.
Talge Mahogany Co., Indianapolis, Ind.
Thompson & Co., Lewis, Philadelphia, Pa.
Toronto Veneer Company, Toronto, Ont.
Veneer Manufacturers Co., Chicago, Ill.
Waetjen & Co., George L., Milwaukee, Wis.
The Williamson Veneer Company, Mills—Baltimore, Md. Sales Branches, New York, N. Y., Chicago, Ill., Jamestown, N.Y., High Point. N.C.
Warren Ross Lumber Co., Jamestown, N. Y.
Wood Mosaic Co., Louisville, Ky.

VENEER SAWS
Atkins & Co., E. C., Indianapolis, Ind.

VENEER TAPE
Canadian Nashua Paper Co., Peterboro, Ont.
Gummed Products Co., Troy, Ohio.
Ideal Coated Paper Co., Brookfield, Mass.

VENTILATING APPARATUS
Canadian Blower & Forge Co., Kitchener, Ont.
Neville-Cooper Co., Toronto.

VENEER JOINTERS
Garlock-Walker Machinery Co., Toronto. Ont.

VENEER MACHINERY
Garlock-Walker Machinery Co., Toronto. Ont.
St. Joseph Iron Works, St. Joseph, Mich.

VENEER PRESSES (Hand and Power)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Perrin & Company, Wm. R., Toronto, Ont.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.

WALNUT LUMBER
American Walnut Mfrs. Assn., Chicago.
Pickrel Walnut Company, St. Louis.
Porter, Frank R. Washington, D.C.
Purcell Walnut Lumber Co., Frank, Kansas City.

WIRE
Laidlaw Bale-Tie Co.. Hamilton, Ont.

WIRE BOX STRAPPING
Cary Mfg. Company, Brooklyn, N.Y.

WOOD FINISHES
Adams & Elting Co., Chicago and Toronto.
Ault & Wiborg, Toronto, Ont.
Penfound Varnish Co., Toronto, Ont.

WOODWORKING MACHINERY
General Machinery Co., Toronto, Ont.
Ober Mfg. Co., Chagrin Falls, Ohio.

WOOD STAINS
Williams Brothers & Co

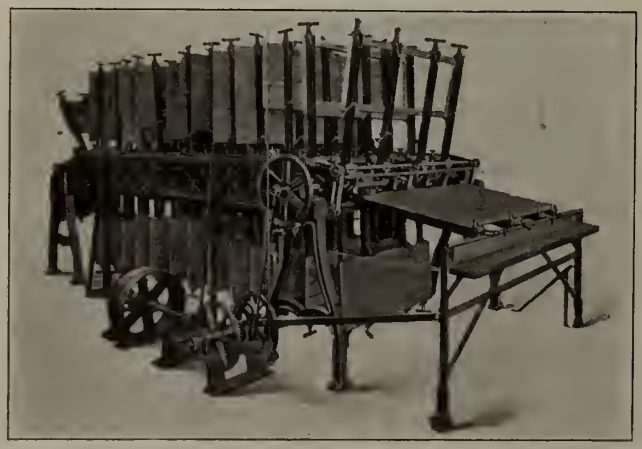
WOOD TURNING MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Yates Machine Co., P. B., Hamilton, Ont.

WORK BENCHES
Fay & Egan Co., J. A., Cincinnati, Ohio.

WOOD LATHES
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOODWORKING SPECIALTIES
Brantford Pattern Works, Brantford, Ont.

One Man Does the Work of Two
with a Billstrom Glue Clamp Carrier



For every plant where much edge-gluing is done there is a real need for a Billstrom.
Here's why:—

The empty clamp is held at just the right height for the greatest convenience of the workman.
When the clamp is filled he pulls a cord, which carries the filled clamp away and deposits an empty one in its place.
One man can accomplish as much by using it as two men can do employing the old methods.
It holds the work off the floor until the glue has set, when the glued stock can be quickly removed and piled flat, thus greatly conserving space.
It reduces the labor and cost of edge gluing to the minimum.
There is a sizs to suit your particular requirements.

N. J. BILLSTROM
2002 NINTH ST. ROCKFORD, ILL.

44 Yates No. 275
36 and 66-in. Automatic
Knife Grinders,
Brand New, at
One-half Price

Machines arranged for Motor Application as per cut, or regular belt drive, if wanted.

We have in Cincinnati, available at once, three Whitney 30-in. single surfacers and two Whitney 30-in. double surfacers, all with sectional rolls; three double arbor revolving saw tables; three single arbor tilting table saw benches; F.&E. single-end tenoner with roller table, and a few other choice machines. All are in exceptionally fine condition—are doing precision work at the present time.

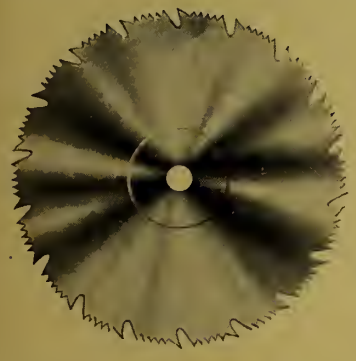
7 New Hermance Molders, 8, 10 and 12-in., Stationary and slip-on heads.
8 New Andrew Multiple Vertical Borers, 20, 30, 42 and 60-in., any number of heads.

Band saws, 32, 36 and 38-in.
Borer, Andrew, 10-ft., 13-spindle, power table.
Borers, Andrew mult. vert., 20, 42 and 60-in., new.
Door clamp, Fay-Egan, heavy.
Door clamp, Jenkins-Hayes power-feed.
Edgers, two, three and four saws.
Glue cookers and retainers.
Jointers, 8, 12, 16, 20, 24 and 30-in.
Lathes, speed, eight, mounted on iron bed.
Lathes, turning automatic, Mattison No. 8
Yates No. 72, practically new.
Matcher, American Northwest, 24x8-in., 3 sides.
Matcher, 24x6-in., 3 and 4 sides.

Molders, 4-side, 9, 10 and 12-in. American.
Molder, Fay & Egan, 12-in. outside, heavy.
Mortiser, chain saw, New Britain No. 7, new.
Mortisers, F. & E. vertical, hollow-chisel; also plunger type; Greenlee vertical, double hollow-chisel.
Nailers, two, Hayes, 8-track, 8d, closed back.
Nailing machines, 2 closed back, 4-track, 4d, 15-in. spread, Hayes' make.
Pony planers, 16, 20 and 24-in.
Rip saws, self-feed, Hoosier, F. & E. Greenlee.
Rip saw, gang, Luther, for box work.
Router for stair stringers.
Sand belt, closet seat and similar work.
Sander, H. B. Smith, spindle and disc, practically new.
Sanders, 30- 42 and 54-in. Columbia; 30, 42 and 48-in. Invincible; 30 and 36-in. F. & E. double.
Saw, 8-ft. double cut-off, roller table.
Saws, combination and variety, single and double arbor, also tilting arbor, stationary and tilting table, 24 and 30-in. circular resaw.
Saw, circular re-slab, 40-in. blade, power feed rolls.
Shapers, Fay single-spindle reversible, also Shimer single with overhead routing attachment.
Shaper, Whitney No. 7 and 8 double-spindle, practically new.
Surfacer, 30-in. double, cabinet, B. & M., practically new.
Surfacer, Whitney 30-in. double, sectional roll and sectional chipbreaker; American No. 4½, 36-in. sectional and solid; Fay & Egan No. 140, 27 and 30-in. double divided rolls; also 18, 20, 24 and 30-in. single cylinder panel planers.
Tenoners, Fay & Egan double-end, also single-end.
Window frame machine for production work, new.
Window frame machines, Smith & Phillips combination.
Wood-worker, universal, Fay & Egan and Bentel & Margedant. One lot of glue room machinery.

We have just received two carloads of Band Saws and Jointers—all new—which are ready for immediate delivery.
Band Saws, 20, 26, 32, 36 and 38-in. Jointers, 8, 12, 16 and 24-in.

The Osborne & Sexton Machinery Co.
Re-manufacturers **COLUMBUS OHIO**



100% Production

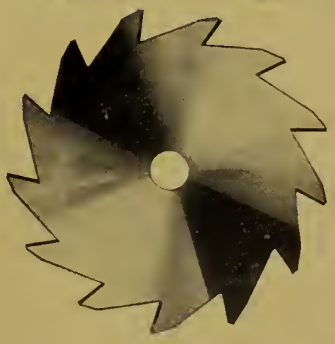
will be necessary to meet the demand for all wood-working material and furniture that will be required for the 4,000,000 buildings that must be erected in 1921.

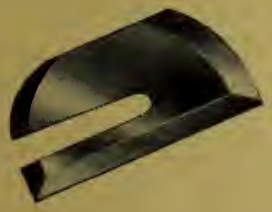
ATKINS

STERLING QUALITY

SAWS and KNIVES

will make it possible for you to meet this demand in producing your share.





The high grade material and expert construction of Atkins Saws and Knives make possible the superior service they render.

Let Their Efficient Performance Tell You the Atkins Story of Perfection.

Write to-day for our Knife Booklet "CW" and Pattern Template Paper.

E. C. ATKINS & CO., ***Makers of Sterling Saws***

Factory—HAMILTON, Ont. **Vancouver Branch—109 Powell Street**

Queen Anne Leg *Turning* and *Sanding* Machines

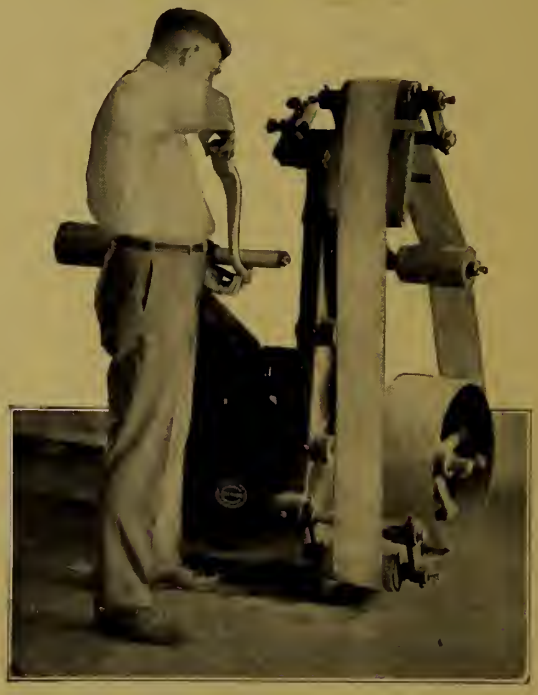
HERE is a real machine method for shaping and finishing legs of Queen Anne design.

The Mattison Automatic Leg-forming Lathe is built specially for furniture work; all details of mechancial construction have been perfected to insure accurate and economical production.

A shear-cutting head takes care of all patterns. The cutting operation is purely automatic, which reduces the labor cost to the actual time required for changing stock. The man who looks after this lathe can also attend another nearby machine; or he can keep three or four of the leg forming lathes busy.

Still another practical and time-saving combination is to have the Mattison Variety Belt Sander set near the lathe, which enables the one operator to sand a leg while another is being automatically cut in the lathe.

New Application of Pneumatic Sanding Drums, Combined with Flexible Sand Belt, Provides a Quick Method for Perfectly Finishing Queen Anne Legs



THE Mattison Variety Belt Sander is a self-contained finishing machine, requiring small floor space. It is well adapted for perfectly sanding in one handling the many curves and irregularities of a Queen Anne leg.

By free-hand manipulation of the leg diagonally against the open sand belt, shaped forms or cushioned sanding rolls, the rough sanding is accomplished very quickly.

The two sizes of pneumatic, sand-covered drums, or spindles, provide a most practical and accurate method for perfectly finish-sanding the legs.

This combination of both rough and finish sanding operations in the one machine, together with the lathe for automatically shaping the legs, gives the manufacturer of Queen Anne furniture a method that minimizes cost and insures accurate production of his individual and distinctive patterns.

Send for Bulletins describing this method in detail

MATTISON
MACHINE WORKS
Rockford, Illinois, U. S. A.

Volume Twenty-One TORONTO, MAY, 1921 Number Five

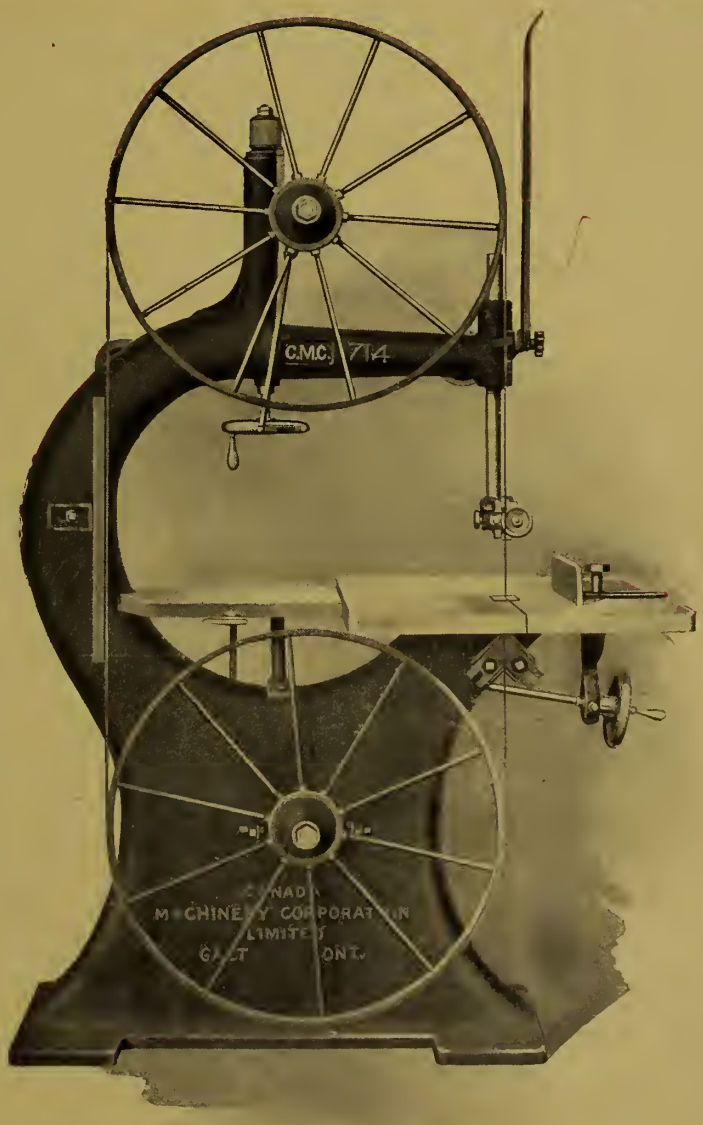
CANADIAN WOODWORKER and Furniture Manufacturer

C.M.C.

No. 714, 36" Band Saw

With Steel Wheels

SPEEDY, ACCURATE, CONVENIENT



A very popular saw for medium or light scroll sawing in pattern shops, furniture factories and manual training schools. It is easily handled and is found especially useful for working with small blades.

The table may be tilted to an angle of 30 degrees and held rigidly in place. It is equipped with an adjustable splitting fence 15" long. A Wright guide, one of the most efficiency guides yet designed, is regularly supplied with each machine.

FULL PARTICULARS AND PRICES ON REQUEST

CANADA MACHINERY CORPORATION, GALT, ONTARIO
LIMITED

Toronto Sales Office - 721 Bank of Hamilton Building.

Alphabetical Index to Advertisers, Page 12

IT'S JUST LIKE THROWING MONEY AWAY

To Use an Inefficient and Unreliable BELT

STOP IT!

You Can SAVE MONEY By Using

D. K. McLaren's Genuine British OAK TANNED Leather Belting

SOMETIMES you hear a man complain that belting is expensive. Investigate and you will invariably find that he has never used a really worthwhile belt—his has been of the cheaper grade, continually stretching, breaking, losing power and causing frequent break-downs.

Belting of that type is, and always will be expensive. Belting costs cannot be figured by the price-tag, but by the ultimate service the belt will render.

Fortunately, most woodworkers know the truth of this so that good belting is the rule and not the exception in the average plant. And it is a significant fact that with the busiest and most progressive of these, D. K. McLAREN'S GENUINE BRITISH OAK TANNED BELTING is the kind used. Our organization is at the service of belting users everywhere to advise them in the selection of the right belt. Can we be of service to you?

D·K·McLAREN LIMITED

Head Office and Factory:
351 St. James Street
Montreal, P.Q., Canada

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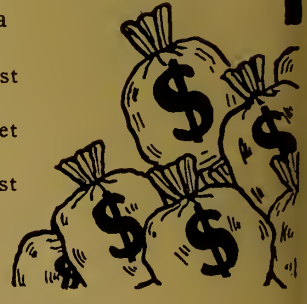
194 King St. West

ST. JOHN, N.B.
80 Germain Street

VANCOUVER, B.C.
334 Cordova West



Invest In Your Own Business

These machines will save you money. They are priced to sell under present conditions. All in our Dufferin Street Warehouse, subject to your inspection. Quotations on machines for any purpose on request.

1—McGregor-Gourlay Double Arbor Universal Saw Table, same as C.M.C. No. 618, with 14" saws, self-contained countershaft, full complement of gauges, saws, wrenches, etc.

1—Preston No. 127 Variety Saw Table, countershaft attached, one 14" saw.

1—Ballantine 36" Band Saw, with solid lower wheel, complete with saw blades, wrenches, etc.

1—Ballantine Two Spindle Shaper, Spindles 20½" centres, diameter of spindles where collars go on 1⅛", top 42" x 42".

1—American No. 1 Single Spindle Shaper. Fig. 937 with plain countershaft.

1—C. M. C. No. 507 Mortiser, with boring attachment.

1—C.M.C. No. 624 Hand Feed Rip Saw Machine, with self-contained counter shaft, table 6'6" long by 40" wide, with plain box gauge, 22" saw blades, 1¼" arbor with cone for receiving saws different diameter.

1—Ballantine 8" Four Sided Moulder, complete with square heads and straight knives on all heads.

1—American No. 2½ Single End Tenoner, with two copes and cut-off saw attachment. Fig. 9431 in American Woodworking Machinery Catalog.

1—C.M.C. No. 646 Roller Table Cut-off Saw, sliding table 7'6" long, stationary table 50" to the saw, sliding table equipped with stop gauge, including five stops, with countershaft, complete with saws, wrenches , etc.

1—Cowan Combination Vertical and Horizontal Boring Machine, complete with wrenches, etc.

1—Hespeler 12" Buzz Planer, fitted with round cylinder, full set of knives, countershaft, wrenches, guard, etc.

1—Preston 36" Band saw, lower web wheel and guards.

8—Sections Cowan Four Screw Veneer Press 12"x50", four sections 27" clear space under screw plates, four sections 32" under screw plates.

1—24" Francis Double Roll Glue Spreader.

4—Sections Cowan Three Screw Veneer Press 38"x12", 28" clear space under screw plates.

1—American No. 4½ Single Surfacer, with solid roll and chipbreaker.

1—American No. 26, 10" Outside Moulder, 4" side heads, latest type machine, complete with knife jointers and all equipment, new straight knives on all four heads.

1—C.M.C. Arm Sander, No. 438, with paper cutter.

1—Universal Knife Grinder, 37", made by American Wood Working Machinery Co., Fig. 1126 in their catalogue.

1—60" Sturtevant Single Slow Speed Exhauster, left hand, top vertical discharge, complete with platform and rods to suspend from ceiling.

1—Cowan Chain Mortiser with grinder.

1—Ballantine 36" Band Saw, lower web wheel.

1—American No. 3 Double Cut-Off Saw, new machine, capacity from 8" to 6' 9" in length, 4" thick and 30" wide.

1—American No. 25 Edging and Ripping Saw, new machine.

1—American No. 30 Double Arbor Universal Saw Bench, new machine.

1—Preston 24" No. 121 Pony Planer, used only couple of months.

1—McGregor-Gourlay 24" Pony Planer.

1—Mershon Band Rip Saw.

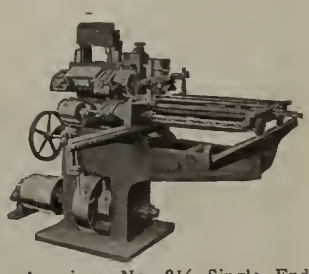
American No. 25 Power Feed Edging and Ripping Saw

Garlock-Walker Machinery Co., Limited

32 Front Street West

WINNIPEG TORONTO MONTREAL

Everything in Woodworking and Metal Working Machinery



American No. 2½ Single End Tenoning Machine

CONDIT

No Power Circuit Should be Broken with a Knife Switch

Condit Type N-2 Oil Switch

Condit Type 1 Oil Starter

By using Condit Oil Starters and small industrial Oil Switches to protect small motors and small power and lighting circuits in woodworking plants, the fire hazard is eliminated and many delays caused by trouble with small motors not properly protected, is avoided. When a circuit is opened, the arc is under oil which immediately extinguishes it. Thus, serious trouble very often caused by knife switch blades burning in ways which prevent proper contact and allowing a three phase motor to operate on single phase, is obviated.

Our Nearest House Can Supply You

Northern Electric Company
LIMITED

Montreal Halifax Quebec Ottawa Hamilton
Toronto London Windsor Winnipeg
Regina Calgary Edmonton
Vancouver

CONDIT: *the Synonym of Safety in Electrical Protective Equipment*

Yates

TYPE C-4
THE
MASTER MOULDER

Will increase the production of your plant. How?

Quick—will run mouldings up to 100 feet per minute.

Accessible—entirely open side from end to end—set ups quickly and easily made—gear guards and hoods easily removable—control devices at operator's finger tips.

Compact—takes up less room than the old sticker.

Durable—base is cast in one piece, flaring at the floor line eliminating vibration so disastrous to the production of fine mouldings, also increases the life of the machine.

These are but few of the features—truly a master machine.

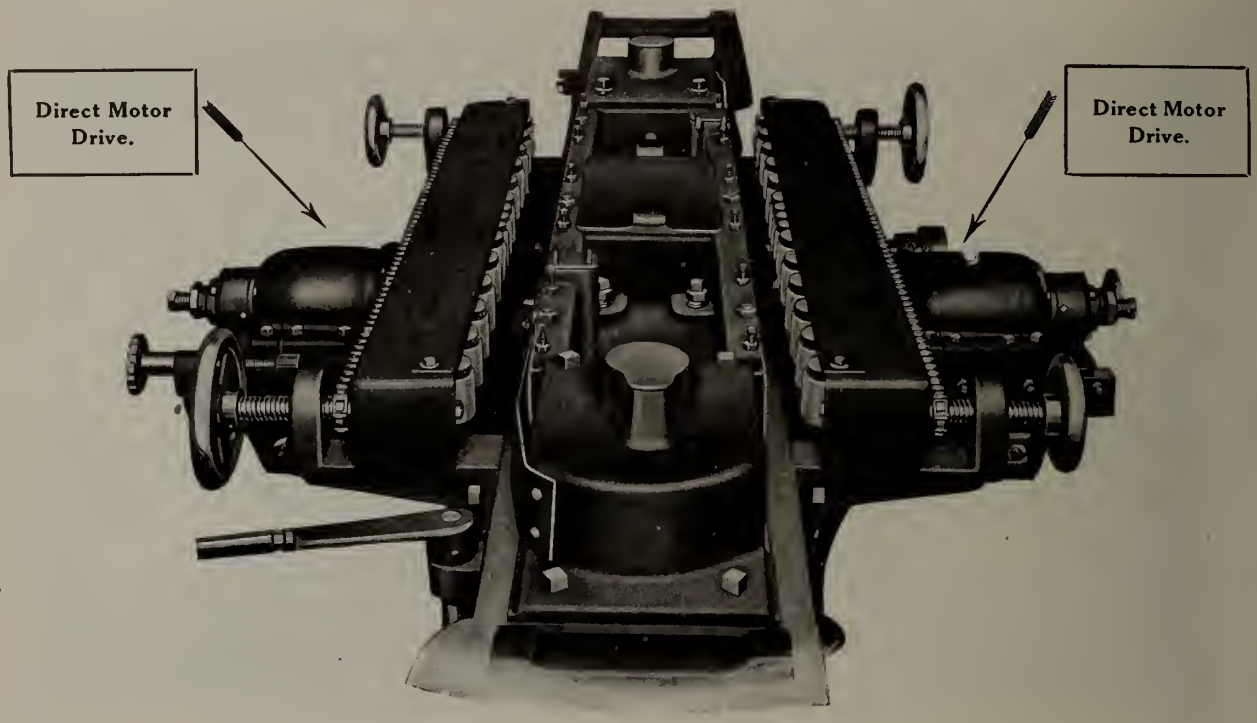
The C-4 is one of the most useful machines.
Look it up—you'll be glad you did.

P. B. Yates Machine Co. Limited

Hamilton - Canada

Ball Bearing Direct Motor Drive Glue Jointer and Edge Molder

No Belts **No Countershafts**



No. 429 "Lightning" Automatic Glue Jointer and Edge Molder

With a continuous feed this machine will make the finest glue joints for the highest class of cabinet work many times faster than is possible by hand or on the old reciprocating types. It is the ONLY Automatic Glue Jointer which can be set instantly to make either a straight, hollow or spring joint.

Write for Bulletin H-12

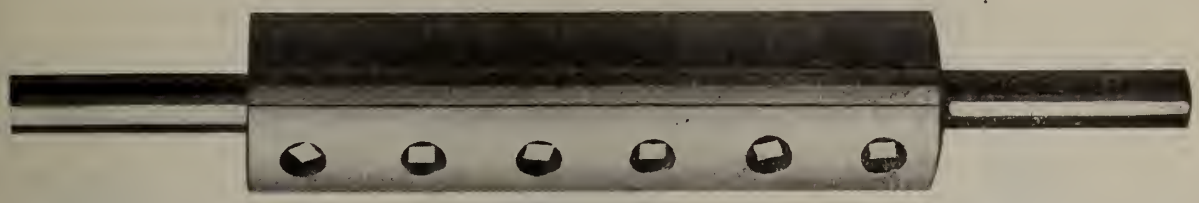
J. A. Fay & Egan Company

ESTABLISHED 1830

World's Oldest and Largest Manufacturers of Woodworking Machinery

153-173 West Front Street, Cincinnati, Ohio

The Shimer Round Safety Cylinder with High Speed Knives



A Round Safety Cylinder that will Appeal to the Buyer and the User for three Reasons:

The first is our adjusting nut for setting the knives. It is the only cylinder with properly located adjusting nuts for setting the knives, which, with our way, can be set to 1-1000 of an inch.

The second is our way of holding the knife without tapping into the head.

The third is the correct angle of cut for the knives.

Made for Any of the Different Makers' Machines and in Any Length Cylinder.

WRITE FOR PRICES

SHIMER CUTTER HEAD CO. OF CANADA, LIMITED

Manufacturers of Cutter Heads, Safety Cylinders and Grinders

GALT, ONTARIO

Simply dump a gross of screws (either wood or machine) into the hopper. The machine does the rest.

Profit by the Experience of others

We know of a large number of woodworking establishments that have reduced their production costs materially by the introduction of automatic

Magazine Fed Screw Driving Machines

Your competitors—many of them—are using our equipment.

If your firm drives screws in quantities in the old way—it is working under a severe handicap, which is sure to react unfavorably owing to higher production costs .

Let us send you our illustrated booklet and list of users in your line.

The Reynolds Machine Co.

Department C.

Massillon, Ohio, U. S. A.

Suppose You Were Making a Very Fine Period Suite, or Perhaps a Phonograph Period Model

This sort of a piece absolutely deserves trimming that is attractive and correct

LET US SEND SAMPLES

F2-4141

WRITE FOR PRICES

WE MAKE IT—and everything else in the Hardware line

WEBER-KNAPP CO., Jamestown, N.Y.

The Handiest Machine on the Market

The Split-tilting table (Patent Applied For) can be tilted and locked at any angle up to forty-five degrees as indicated on the graduated segment. This machine is also supplied with a solid table. The Boring Attachment is very complete in itself. A foot lever is connected with the table which slides back and forth on the knee. A large coil spring located in the column of the machine automatically releases the work from the bit when pressure is removed from the foot lever. The Boring Attachment is raised or lowered by means of a handwheel connected with a pair of mitre gears. The spindle is bored to take standard size bits and can be arranged for a hollow chisel mortiser. Special cutters may be used by removing the throat in the table. Each machine is furnished with one ten inch saw, belt and wrench.

Write for prices and pamphlet describing this time and labor saver more fully.

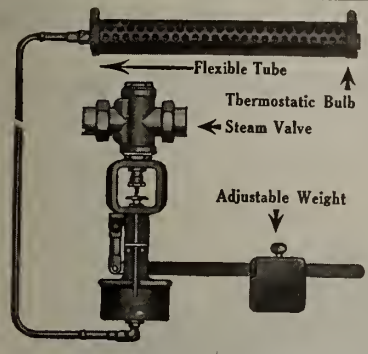
Cross-cut Mitre & Rip Saw Machine showing Split-Tilting Table & Boring Attachment

D. McKenzie Machinery Co.

MANUFACTURERS

GUELPH, ONT. CANADA

Strike!



The Powers No. 15 Regulator

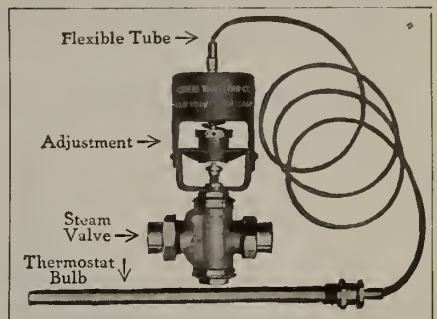
Here is a regulator that will control your dry kiln, or your varnish room, or other similar process, saving fuel and improving product.
Send for Bulletin 138.

Responsibility is irksome to some men—routine to others.

Automatic control of temperatures relieves men of both responsibility and routine—it helps to relieve the "spirit or unrest," which seldom occurs where tasks are not irksome.

Some of the Causes!

Begin now to eliminate some of the causes of discontent by putting Automatic Heat Regulators on your dry kilns, ovens, varnish and dry rooms, heating systems, hot water tanks, shower baths—and every place where heat control is desired.



The Powers Regulator No. 11

Specially adapted for the control of liquid temperatures as in hot water tanks, glue pots, dry kettles, etc. Entirely automatic and self contained requiring no outside power for operation.
Send for Bulletin No. 129.
other designs for other uses, wherever heat control is desirable.

Powers Heat Regulators

These accurate, dependable machines positively and automatically control the heat at the point of use. Their economy is fourfold.

1. They save labor by releasing men who now attempt to control heat by hand.
2. They save material by preventing losses from spoiled or sub-standard output.
3. They save fixtures by preventing overheating.
4. They save fuel by using only necessary heat.

We have spent more than thirty years in studying temperature control and have gained a vast fund of practical information which is cheerfully at your service.

The Canadian Powers Regulator Co., Ltd. SPECIALISTS IN AUTOMATIC HEAT CONTROL **82 Chestnut St., Toronto, Ont.**

The Mereen-Johnson Resaw

has many features of advantage which place it far ahead of anything in the Resaw field.

No pulleys—no belts—no frictions.

The sprocket and chain arrangement for changing speeds is only one of the many improvements on this machine.

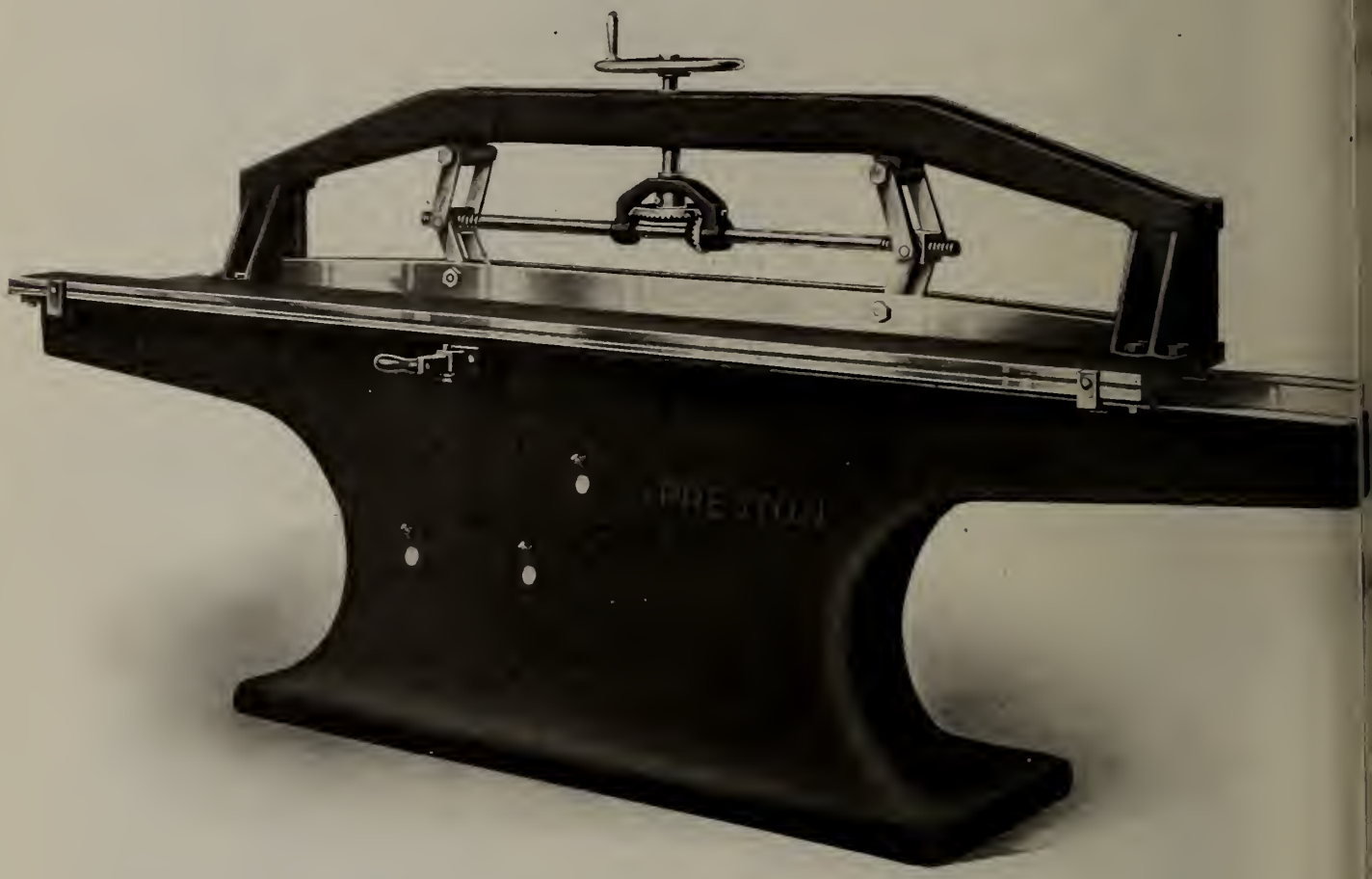
Write for circular.

Mereen-Johnson Machine Co.
Minneapolis - Minnesota, U.S.A.

The only

VENEER JOINTER

that will effectively joint buckled veneer



No. 181 "Preston" Veneer Jointer

THIS MACHINE was designed and built for the purpose of making commercially perfect face joints butt or crosswise as well as lengthwise of the grain on the highest figured circassian walnut or crotch mahogany veneer.

One of the most essential features of a machine of this kind is RIGIDITY. Examination of the frame or column on above illustration will show the massive construction of same which is of cored section and cast in one solid piece. This guarantees absolute accuracy in the table Vee ways at all times, thus contributing to a perfect joint being made on straight or curly stock at one operation.

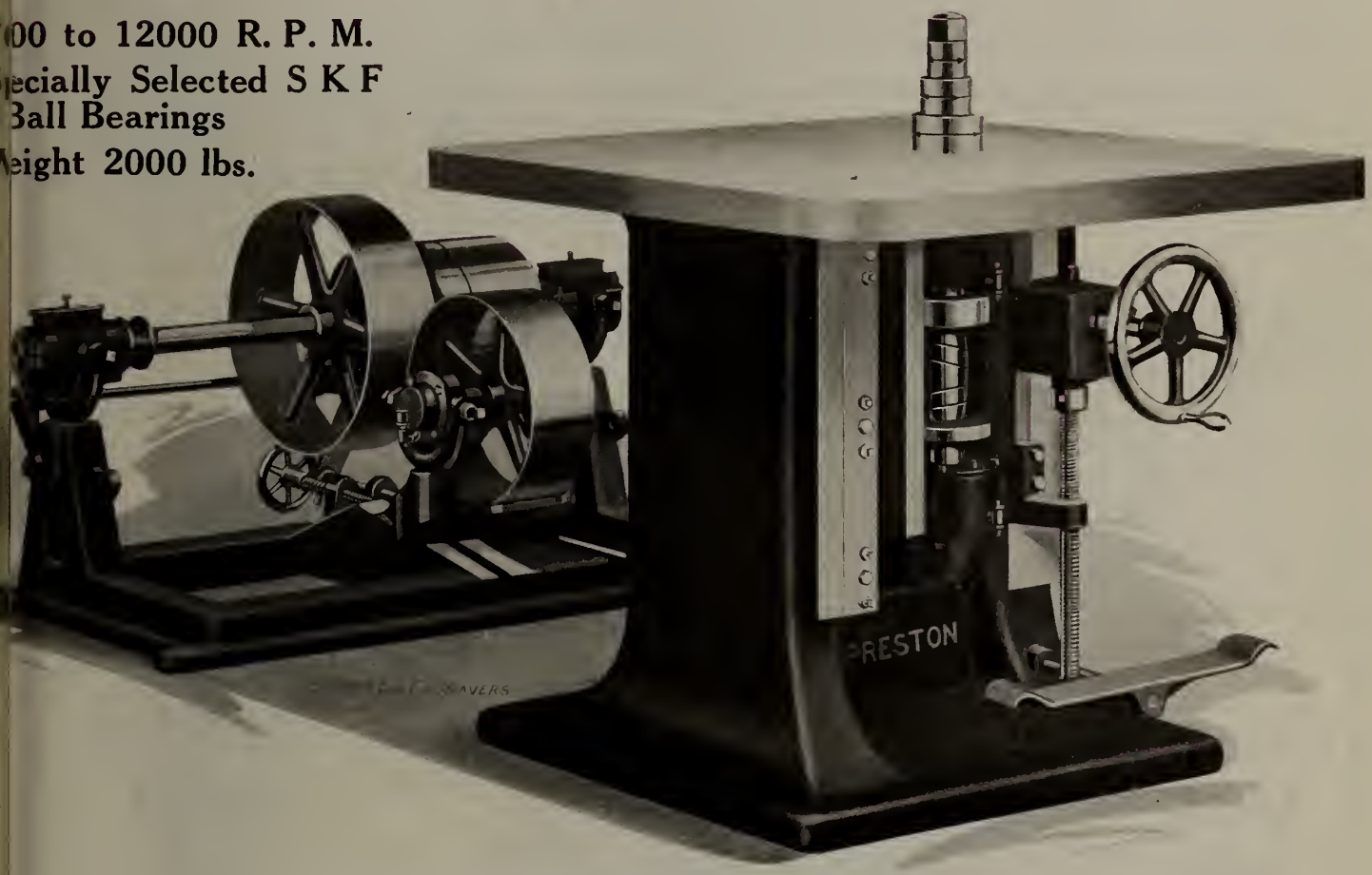
The Preston Woodworking

We are the Sole Manufacturers and Agents in Canada of the Eaglesfield Patented Beltless Swing Saw—See advertisement page 17.

Don't Waste Time

by having a shaper in your plant which is not 100% efficient

00 to 12000 R. P. M.
ecially Selected S K F
Ball Bearings
eight 2000 lbs.



Cut showing machine with single spindle

Preston" No. 162 High Speed Ball Bearing Shaper

Built with either one or two spindles

It may be that now when things are a bit slack is the best time to arrange and re-arrange your plant to receive the maximum of efficiency from both men and machines. If we can be of any assistance in helping you plan or suggest means by which this can most economically be arranged, write us.

Machinery Company, Ltd.

PRESTON, ONTARIO

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COWAN WOOD TOOLS are the BEST

POWER FEED RIP SAW 280

Variable Feed. Large Table. Simple, Strong, Compact.
Feed Works and Table both adjust by Hand Wheels.
Adjustable for Short or Long Stock. Feeds Stock 6" Thick.

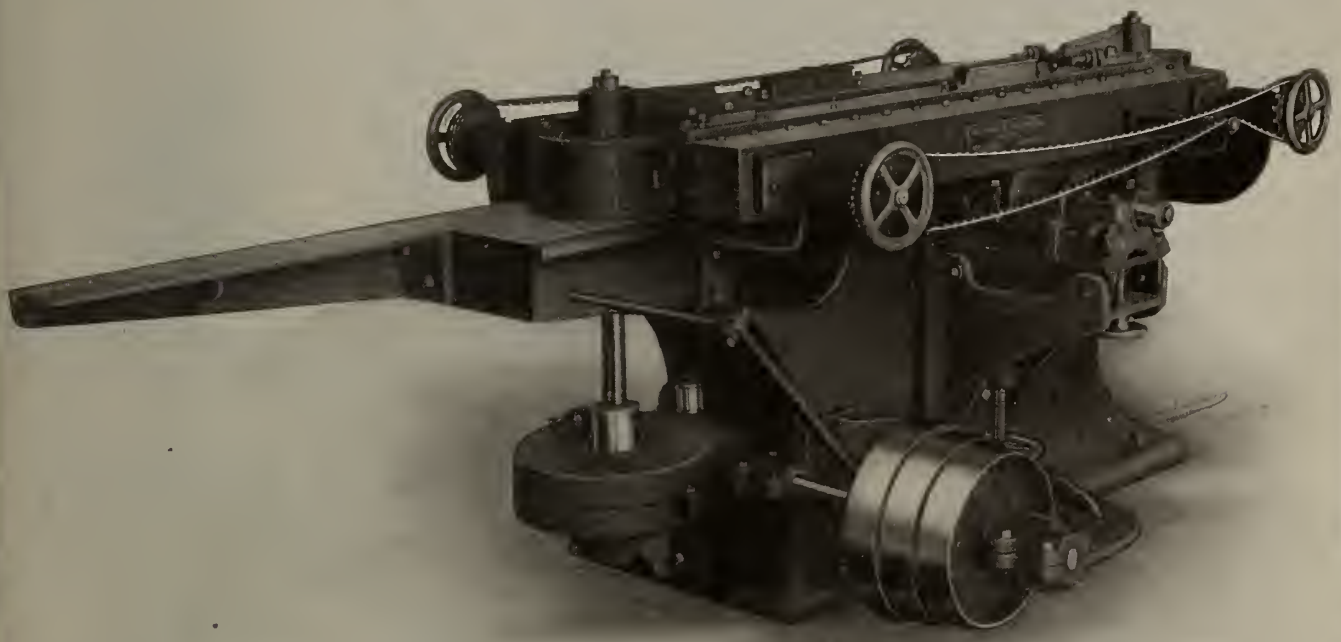
COWAN & COMPANY OF GALT LIMITED

GALT - ONTARIO

Will do the work of Five Hand Jointers in making Glue Joints

This is the guarantee given with our

No. 4 Continuous Feed GLUE JOINTER

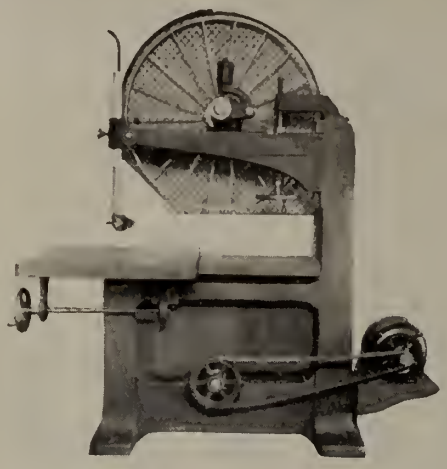


Strongest and most complete machine on the market.
Any part may be readily removed or renewed.
Feeds in opposite direction, giving 100 feet per minute.
Works material from six inches up to any length desired.
Also from one quarter to 3 inches thick, and from three-quarters of an inch wide up to any width.
1 set Shimer Special Jointer Heads supplied with machine.

Investigate the merits of this machine—it will pay you!

Jackson, Cochrane & Company

KITCHENER - CANADA



West Side

Band Saws for these reasons:

To operate a West Side band saw—or even to see one—is to realize what careful experienced designing means to machines of this character. Most convenient of operation: uncommonly strong.

We build band saws of convenience and capacity, each model with choice of **three drives:** direct motor—belt—gear.

MOTOR DRIVEN BALL BEARING No. 78

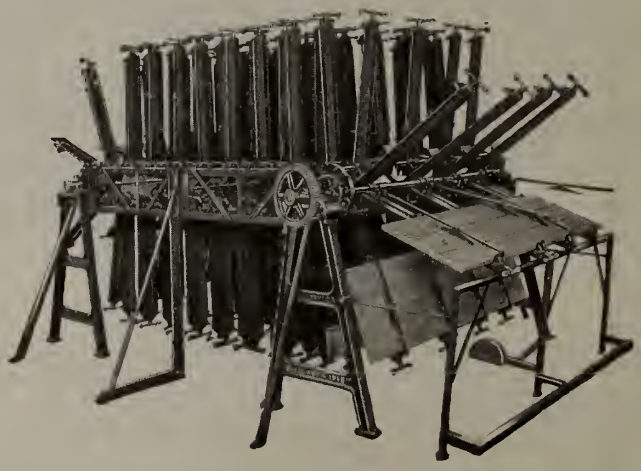
—illustration to the left is of our 42-in. straight column frame band saw possessing important superiorities. Trus-running; perfectly balanced; improved work table for quick, accurate angle work. Ask for full information.

THE VERY BEST

West Side Iron Works

Factory: GRAND RAPIDS
General Offices: CHICAGO

The Taylor TRADE MARK



The Taylor TRADE MARK

Clamp Carrier

Largest Capacity
Smallest Floor Space

Quickest Acting Most Powerful Clamp Known

One user writes:—" Additional equipment has so speeded up our Jointing Department as to necessitate the installation of a TAYLOR CLAMP CARRIER."

A. R. WILLIAMS MACHINERY CO., Toronto, Canada—Representatives

James L. Taylor Manufacturing Co.

POUGHKEEPSIE, N. Y.

"The change will come overnight"

said a prominent banker the other day in discussing the expected mid-summer change from present conditions to a real upward swing of business activity.

"The present situation is largely a mental condition, it will go as suddenly as it came"

The time to improve your boiler equipment is now.

A Section of our Boiler Department

Engineering and Machine Works of Canada, Limited
St. Catharines, Ont.

Eastern Sales Offices:
Hall Machinery Co., Sherbrooke Que., ar d Birk's Bldg., Montreal.

Speed Up the Work

No Breakdowns - No Delays

With

"BEAVER" BAND-SAWS

NOTE—When measuring points count the points at each end of inch, as per illustration. 3 points are two teeth, etc.

When there is a big cutting job ahead in the sawmill, box factory or woodworking shop, RADCLIFF SAWS are the ones to rely on. They will give you the greatest satisfaction.

BEAVER BAND-SAWS are made from the highest grade Swedish Crucible Steel—keen-cutting and strong. Let us send you particulars and prices.

Radcliff Saw Manufacturing Company, Limited
1550 Dundas Street West **TORONTO, ONT.**
AGENTS FOR L. & I. J. WHITE CO., MACHINE KNIVES

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Panel Veneer in Exceptionally Fine Figuring

Beautiful

BLACK WALNUT

Virginia Timber

Choice Stock for Floor Lamps and Candle Sticks.

FRANK R. PORTER

WASHINGTON, D.C., U.S.A.

Saw, Veneer and Export Logs

Eaglesfield "BELTLESS" SWING SAW

Announcing——

A new design with special high-torque small-diameter

MOTOR DIRECT ON ARBOR

In addition to the present type of EAGLESFIELD BELTLESS SWING SAW, motor gear-connected, which was put on the market in 1919, we now announce a new design, with motor mounted directly on 2-in. spindle—gears entirely eliminated.

With ample power for saws up to 24-in., this new design permits a range of cutting from the small shop requirements up to heavy-duty service in car shops and saw mills.

Motor connection takes up only 3½ in. of saw, leaving ample clearance—as on a 24-in. saw, 8¼-in. cutting surface is available. Saw can be trammed for more accurate cutting than you have been accustomed to.

The unified hanger construction, resilient spring action, and the 7-in. section column are identical with the gear-head machine.

Motor is of the enclosed, built-in type, 25 or 60-cycle, 2 or 3 phase, any voltage. Extra large size S K F ball bearings. Saw up to 24-in. included in equipment.

Made in Canada

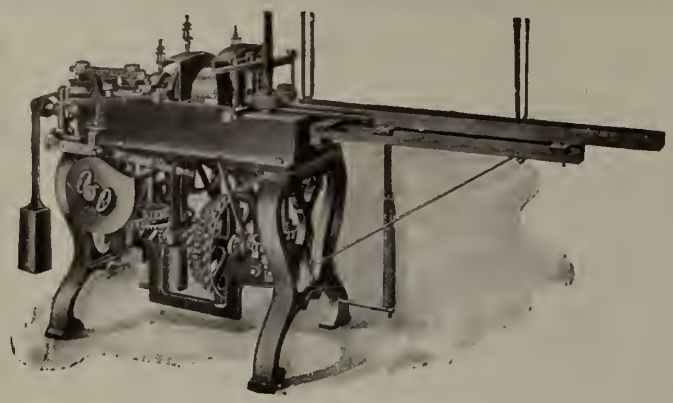
Preston Woodworking Machinery Co.
PRESTON - ONTARIO

R. D. EAGLESFIELD
22nd St. and Northwestern Ave. INDIANAPOLIS, IND.

"Every board you use has to be cut off"

Have You a Circular of the

Eaglesfield "BELTLESS" TILTING ARBOR SAW



Make More Money

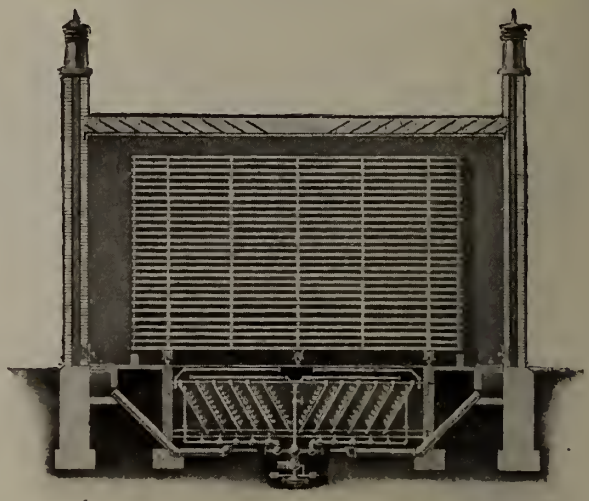
by working your timber into HANDLES and other turned work.

We build machines for making Handles of various kinds, Whiffletrees, Neckyokes, Ball Bats, Spindles, Flag Poles, Vienna Chair Bows, etc. Lathes, Sanders, etc.

Write for complete information and free catalogue No. 31

THE OBER MFG. CO.
CHAGRIN FALLS. O., U.S.A.

Thermo-Myst System



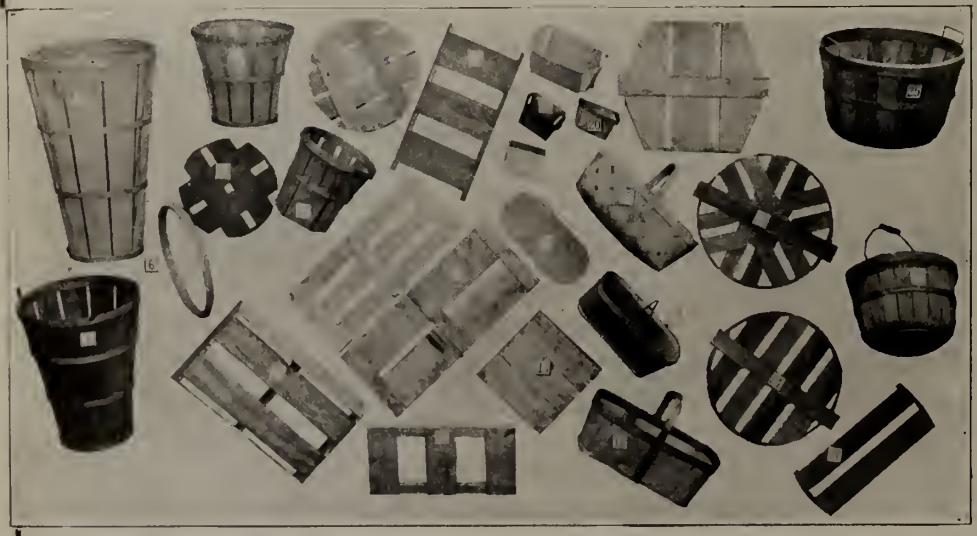
BEFORE YOU BUILD

DRY KILNS

Investigate the merits of our system. Catalog and layouts mailed on request.

Curtis-Hosey Dryer Co. of Canada
177-179 Duke Street, MONTREAL, P.Q.

THIS IS THE NAME



of the Machinery for the Rapid Production of

Veneer—Crates—Baskets—Fruit Packages.

"St Joe"

Get the name fixed in your mind.

ST. JOSEPH IRON WORKS, St. Joseph, Michigan

Cutler TRADE MARK

One Kiln Does the Work of Two

One Half the Time and Better Quality

Install one Cutler Lumber Kiln where two of other makes have been recommended.

IT WILL SAVE YOU

one half the ground space -one half building cost—one half kiln equipment—one half handling equipment and one half labor cost.

Let us solve your drying problems—Write for catalog

DRY KILN DEPARTMENT of CUTLER DESK COMPANY

Drying Specialists - Buffalo, N.Y., and Bridgeburg, Ont., Mentholatum Bldg.

Pacific Coast Division: Office: Babcock Building, 310 California Street, San Francisco, California

HART MIRROR PLATE CO.

IMPORTERS AND MANUFACTURERS OF

GRAND RAPIDS QUALITY

MIRRORS

Grand Rapids, Mich.

A great many Hart craftsmen have made Hart Quality Mirrors for 20 years. Moreover, they learned their trade in Europe. Old World skill with New World methods means Grand Rapids Quality Mirrors at quantity production prices. Hart Mirrors are finely finished in every respect and shipped with unusual promptness.

Makers of Highest Grade Mirrors and Plate Glass Tops Since 1900

GLUE

FOR THE FINEST CABINET WORK AND VENEERING.

Suitable for All Climates.
Great Strength & Light Colour.

SAMPSON & WHITE, Ltd.

6, HOLBORN VIADUCT, LONDON, E.C.

MILL PIPING

Shaving and Sawdust Collecting Systems Installed Complete

ALTERATIONS — REPAIRS

Neville - Cooper Co.

130 Ontario St. Toronto

Phone Main 2157

We also manufacture and erect Smoke Stacks, Boiler Breechings, Metal Cornices, Skylights, Eavetrough, etc.

"CASCO" Waterproof Glue

Mixed Cold—Used Cold

Simple to prepare—can be applied with your present equipment. Comparative tests have convinced thousands of manufacturers of the merits of "CASCO" for jointing and veneering, both from the standpoint of quality and cost. Why not let us tell you about it?

The Casein Manufacturing Co.

Manufacturers of Casein Glues for twenty-five years

15 PARK ROW NEW YORK CITY

NOTE. Send for Casco Red Book. It contains much information on glue, veneer and panels.

Efficient and Economical

Manufacturing plants and woodworkers seeking the most efficient and economical method of glue handling should investigate

"INTERNATIONAL" Electric Glue Heaters

Constructed of heavy spun copper, no seams. Portable—fit any lamp socket. Give uniform working temperature. Operate on less current than any other electric glue heater.

Write for illustrated folder "Correct Temperature in the Glue Room," and quotations on International Heater sizes one pint to 50 gallons.

INTERNATIONAL ELECTRIC COMPANY

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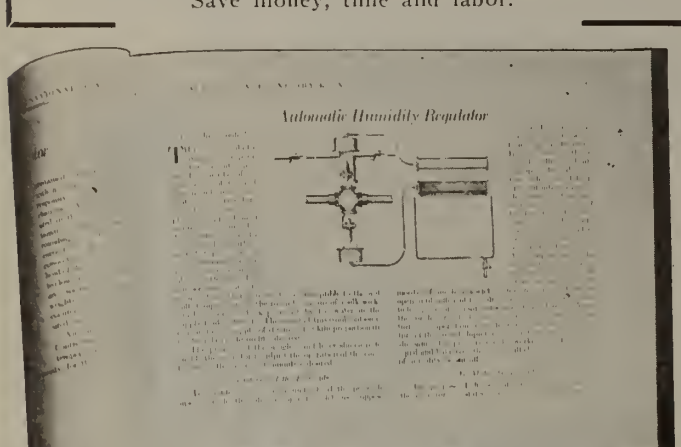
"International Electric Heaters are Better."

IT IS NECESSARY TO CONTROL HUMIDITY

in order to successfully operate a dry kiln. It is not practicable to do this manually. The thing to do is to install

Automatic Humidity Controls

Save money, time and labor.



The first kiln in six thousand years in which humidity is automatically controlled. Ask for new catalog.

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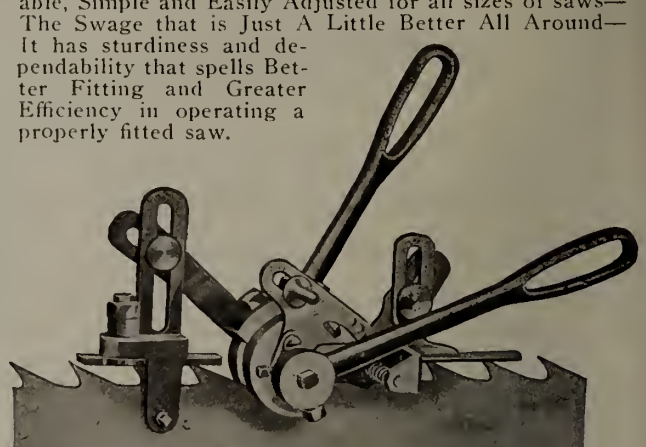
The construction of the Crowell Swage is the secret of CROWELL SUPERIORITY—Right Design, Reliable, Simple and Easily Adjusted for all sizes of saws—The Swage that is Just A Little Better All Around—It has sturdiness and dependability that spells Better Fitting and Greater Efficiency in operating a properly fitted saw.



D. J. CROWELL

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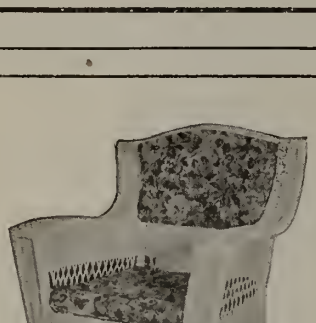
Canadian checks accepted at PAR

All Crowell Swages reduced to pre-war prices



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Art-Fibre is all that its name implies. Spun from the finest quality of sulphite stock, its smooth uniform surface produces results when properly finished, that correlates with the most artistic designs and the finest quality of upholstering materials.

Because of its known reliability, economy, and excellent quality ART FIBRE SERVES BEST.

Samples and prices sent upon request.

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Grand Rapids, Michigan

Perkins Vegetable Glue

PERKINS 183 was the FIRST VEGETABLE GLUE ever sold to high grade woodworking concerns and PERKINS 183 is now the last word to be said of a HIGH GRADE, UNIFORM QUALITY GLUE. Much money and effort have been spent on work covering a period of years; many changes were made in the formula until the present manufacturing process of 183 was reached and for fourteen years this glue has successfully filled the requirements of HIGH CLASS GLUE. Both our research and factory laboratories are constantly working to improve manufacturing methods and we shall never be satisfied to give the trade anything less than the best.

The Home of

PERKINS 183

TRADE MARK (Reg. U.S. Pat. Off.)

Our Canadian Factory is located at Hamilton, Ont.

Process and Product Patents covering Perkins Glue were granted July 2nd and March 19th, 1912, and have been held valid and infringed by the United States Circuit Court of Appeals. Patents have also been granted in Canada, Great Britain, Germany, France, Belgium, Italy and other foreign countries.

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For repairing splits, checks and other defects in face veneers. Made in colors to meet the requirements of the best finishes of all cabinet woods.

Put up in tubes for convenient use on surface stock and in quart cans for larger defects in core stock.

PERKINS GLUE COMPANY

Factory and General Offices:
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Sales Office:
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Peels off in one piece

An Innovation for Veneer Manufacturers

Save Time
Save Labor

TROY SEALING TAPES

Magic Veneer Tape

Made of Special Troy Kraft Paper, heavily gummed, insuring instantaneous adhesion. After soaking, it can be easily pulled off in one piece, eliminating the necessity for sanding and scraping which other methods incur.

Write for sample coil and prices.

We also manufacture cloth veneer tapes, samples of which we will be pleased to mail you upon request.

The
Gummed Products Co.
TROY OHIO

CANADIAN NASHUA PAPER CO. LTD
SERVICE PRODUCTION QUALITY
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NASHUA Veneer Tapes

Are manufactured with a view to giving the consumer the material for his purpose, and we stand ready to develop any special requirement for you.

In purchasing our tapes you are assured of prompt, **service** guaranteed **quality** and a reasonable **price.**

Samples of our stock will be sent upon request, so that you may try them out in your plant in a practical way.

CLOTH and PAPER
Guaranteed Veneer Tapes

THE CANADIAN NASHUA PAPER CO., Ltd.
Peterborough, Ont.

An Efemco Product

A "Rockless", Dependable Metal Bed Caster

The sturdy spring on the EFEMCO Metal Bed Caster has a four-point contact with interior of tube, holding the caster securely upright. The spring is forced together by the tube into which it fits, the grooved portion then forming a perfect bearing allowing the caster to turn freely.

The EFEMCO Metal Bed Caster is also made in the ball bearing and roller bearing types. Up to 1½" sizes it is finished with cupped washers. Above that size with leg mounts.

Made to fit tubes of the following sizes in iron pipe—⅞", 1", 1 1/16" 1¼" and 1½". Round tubing—1½", 1 9/10", 2", 2½" and 3". Square—1½", 2", and 2½".

We can supply this caster with maple, lignum-vitae, steel, iron or fibre wheels. It's a genuine EFEMCO Product and of the usual EFEMCO quality and dependability.

Write for catalog showing new lines of improved Efemco Casters.

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Grip Neck Casters
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Standardized by 85 years of service

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EXCEPTIONAL BARGAINS

appearing in our regular Monthly Woodworking Machinery List, are as follows:—

If It's Machinery—Write "WILLIAMS"

No. 51252	7½′ Taylor Clamp Carrier, 40 sections, 160 clamps. Practically new.	48845	New Britain Chain Mortiser, used.
51287	Universal Woodworker, with 26″ Band Saw, Reversible Shaper, 12″ Jointer, and Boring Machine, with self-contained c/s. Used.	71717	No. 312 Morgan Box Trimming Machine, used.
42325	Baker Bros. Dowel Machine, 2½″, used.	50659	No. 10 Morgan Nailing Machine, with double row of chucks and clinching device, used.
50950	Preston Veneer Taping Machine, 36″, used.	48629	Meeren-Johnson Boxboard Squeezer, used.
50577	No. 155 Jackson Cochrane Band Rip and Edging Saw, used	51140	No. 10 Ober Lathe, for turning handles, 1-11/16″, new.
51162	36″ Preston Band Saw, new.	51165	No. 4 Waymoth Lathe, with sizing rings, used.
51129	42″ McGregor Gourlay Band Rip Saw, used.	43906	Preston Manual Training Lathe, with motor drive, new.
50944	Preston High Speed Ballbearing Shaper, slightly used.	51176	Yates No. 108 10″, 4-side Moulder, used.
42671	Cowan, M. 93, 2 Spindle Shaper, Iron Table, 42″ square, spindles 1″ dia. 20″ centres, new.	50781	Cowan Door Sticker, used
51131	C.M.C. 12″ Jointer with round safety cylinder, new.	48143	S. A. Woods, 15″ x 6 Inside Moulder, used.
48850	42″ Berlin Invincible 3 Drum Sander, used.	51181	Yates 2-G Straight Edge Ripper, with revolving bed, 10″ saw, used.
42780	Beach Disc and Drum Sander, new.	50735	Wood Frame Rip Saw Table, used.
		50736	Cowan, No. 208, Boxmaker Rip Saw, used.

Our Monthly List is the largest and most comprehensive list of first-class Woodworking Machinery issued.

THE PRICES ARE RIGHT

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Phone Woodworking Machinery Dept., Adelaide 20

Full lines of Iron and Wood-Working Machinery, Boilers, Engines and Contractors' Machinery, Electric Motors, Saws, Shingle and Lath Mill Machinery, etc

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Canadian Planing Mill Exhauster

Keep your shop clean, remove your sawdust, shavings, or other loose material.

A clean shop with machines free from shavings, chips or sawdust makes for greater efficiency.

Let our engineering department help you plan your refuse exhaust system.

Write for Catalogue 400-13

Canadian Blower & Forge Co.

KITCHENER, ONT.

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In no phase of our business is care more thoughtfully exercised than in the selection and training of men for their places in this organization.

The importance of this will be recognized by those who realize the value of fire prevention work.

Our insurance policy is not only a guarantee of prompt payment of fire loss, but it also carries with it a service that includes a regular fire prevention inspection on your property.

A thorough fire prevention inspection may save your property from destruction, and it will also assist a great deal in accumulating larger savings which will result in better insurance for less money.

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Glass Paper, Flint Sand Paper, Garnet Paper

IN SHEETS AND ROLLS FOR ALL PURPOSES

Rolls 50 yards long, 18 in., 20 in., 24 in., 30 in., 36 in., 40 in., 42 in. and 48 in., wide

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ROTARY CUT SINGLE PLY GUM and POPLAR	DESK and TABLE TOPS in all WOODS	THREE and FIVE PLY PANELS in all WOODS	VENEERED and SOLID DOORS STANDARD and SPECIAL

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Bale ties, Nails and Wire of every description are manufactured by us. We manufacture to your order.

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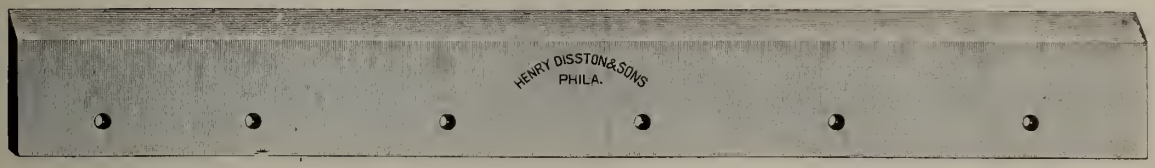
ALL STYLES OF KNIVES FOR WOODWORKERS



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Disston knives cut fast and clean ,and hold their cutting edge.

Write for the Disston booklet on Machine Knives.

HENRY DISSTON & SONS LIMITED
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Branch: Vancouver, B. C.

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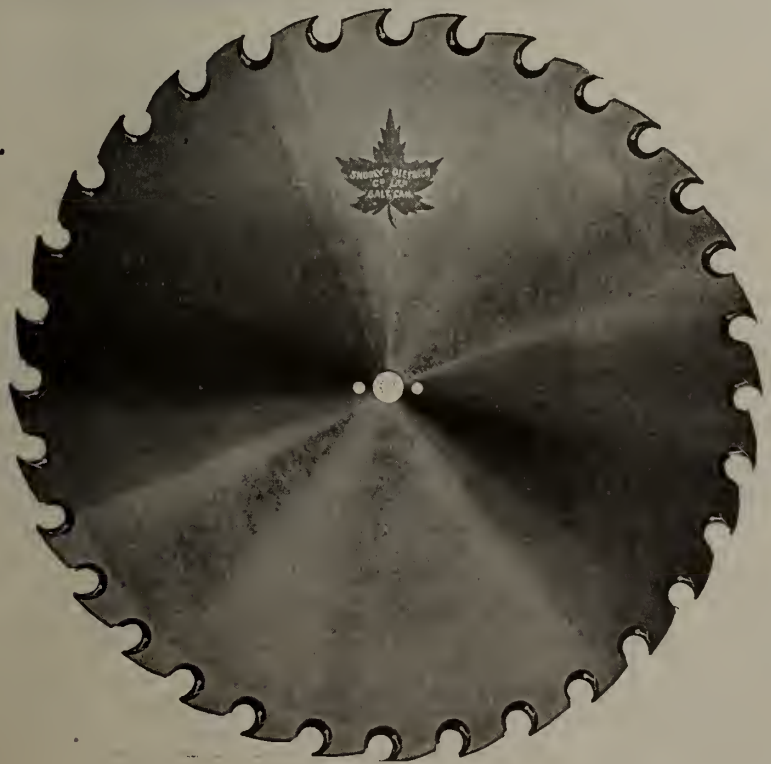

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"Crowell" Swages and Shapers

Maple Leaf Saws are made by the largest All-Canadian Saw Manufacturers

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We specialize in the following Crating lumbers
Spruce, White Pine, Jack Pine, Norway Pine, Balm, Poplar, Birch, Maple, Basswood and Elm.

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We can furnish you immediately Factory Stock including all grades and thicknesses of

Walnut, Chestnut
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ALSO

VENEERS

Oak, Maple, Walnut and other Fancy Woods

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Limited

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Information furnished as to the qualities, weights, strengths, and uses of all woods

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Telephone Main 6872. Note: We do not quote prices.

E. M. Nicholson & Co.

Wholesalers of Canadian Hardwoods
201-2-3 Board of Trade Bldg.,
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Special Items of Interest
for Prompt Shipment

WHITE ASH			
11,000′	4/4	No. 2 C&B	
BROWN ASH			
60,000′	4/4	No. 1 C&B	
16,000′	6/4	No. 1 C&B	
8,900′	8/4	No. 1 C&B	
BASSWOOD			
75,000′	4/4	Sel. & Fas.	
100,000′	4/4	No. 1 & 2. Com.	
75,000′	6/4	No. 1 Com. & FAS	
50,000′	6/4	No. 2 Com.	
40,000′	8/4	No. 1 C&B	
MAPLE			
75,000′	4/4	Log Run	
BEECH			
65,000′	4/4	Log Run	
BIRCH			
30,000′	4/4	FAS	
90,000′	4/4	No. 1 Com.	
150,000′	4/4	No. 2 Com.	
30,000′	5/4	No. 1 Com. & FAS	
45,000′	6/4	FAS	
60,000′	6/4	No. 1 Com.	
75,000′	6/4	No. 2 Com.	
100,000′	8/4	Sel. & Fas.	
150,000′	8/4	No. 1 Com.	
100,000′	8/4	No. 2 Com.	
75,000′	10/4	Sel. & Fas.	
125,000′	10/4	No. 1 Com.	
250,000′	12/4	Sel. & Fas.	
100,000′	16/4	Sel. & Fas.	
SOFT ELM			
45,000′	4/4	No. 2 C&B	
21,000′	6/4	No. 1 C&B	
22,000′	8/4	No. 1 C&B	
150,000′	4/4	Basswood, Birch, Ash, Elm, No. 3 Com. Under National Rules.	

Hardwood Dowels

Plain, Straight and Spiral Grooved

"Canada Wood" dowels are manufactured from high-grade Maple, Birch, Beech or White Oak, uniform in length and nicely pointed, quality guaranteed.

We also manufacture Bailwoods and Variety Turnings in all styles, sizes and descriptions, in the plain, or Enamelled in Black, Natural Wood or Mahogany finishes. Three-eighth in. Maple, Birch and Quarter Cut White Oak Flooring a Specialty. Broom and Mop Handles of every description.

Canada Wood Specialty Co.

Orillia, Ontario

Sawmills at Zebra and Orillia, Ont.
Cable Address: "Special," Orillia, Can.

Anderson, Shreiner & Mawson

Phone Main 1604 WHOLESALE LUMBER 43 Victoria St., TORONTO

Birch, Maple, Elm, Ash and Basswood

Write or "Phone" for Prices. **Mills at South River, Ont.**

We Can Supply

full or mixed cars for immediate shipment. All grades and sizes of

Hard & Soft Maple
Rock & Soft Elm
Beech & Birch
Basswood
Hardwood, in 4x4, 4x6, 1" & 2" No. 3 Com.

Your enquiries are earnestly solicited and your orders will be properly taken care of.

The Pedwell Hardwood Lumber Company

FOOT SPADINA AVE. - TORONTO

Stock on Hand in Kitchener for Immediate Shipment

3,000	ft.	4/4 x 10 in. and up Qt'd White Oak Fas.
12,000	"	4/4 x 6 in. and up Qt'd White Oak Fas.
15,000	"	4/4 x 6 in. and up Qt'd White Oak No. 1 com.
2,680	"	3/4 x 13/17 Sap Gum Fas.
4,700	"	3/4 x 3/12 Sap Gum No. 1 Com.
400	"	5/4 x 6 in. Plain red Gum Fas.
4,000	"	4/4 x 6 in. up Sap Gum No. 1 Com.
5,000	"	8/4 x 6 in. up Qt'd red Gum C. & B.
8,000	"	5/4 x 6 in. Plain White Oak Fas. ... ...
2,000	"	6/4 x 4 in. Plain White Oak No. 1 Com.
15,000	"	6/4 x 6 in. Plain red Oak Fas.
10,000	"	8/4 x 6 in. Plain red Oak Fas.
25,000	"	8/4 x 4 in. Plain red Oak No. 1 Com.
12,000	"	4/4 x 3 in. Tenn. Red Cedar No. 1 C. & B.
25,000	"	8/4 Sound Wormy Chestnut
2,000	"	5/4 Sount Wormy Chestnut
32,000	"	6/4 Sound Wormy Chestnut
5,000	"	4/4 Chestnut No. 1 C. & B.
10,000	"	5/4 Chestnut No. 1 C. & B.
10,000	"	6/4 Chestnut No. 1 C. & B.
43,000	"	4/4 Soft Elm No. 3 C. & B.
1,000	"	4/4 Soft Elm No. 3 Common
12,000	"	8/4 Soft Elm No. 2 C. & B.
15,000	"	12/4 Soft Elm No. 2 C. & B.
5,285	"	12/4 Oak No. 2 Common & Better
6,000	"	12/4 Oak No. 2 and 3 Common
12,000	"	4/4 Hard and soft Maple No. 3 C. & B.

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Wood Turnings, Hardwood Dowels, Turned Table Legs, Kitchen Tables, Kitchen Cabinets, Oak Extension Tables, Oak Library Tables, "Empire Brand" Hardwood Flooring in Maple, Birch, and Plain or Quarter Cut Oak, Solid Pine and Veneered Hardwood Doors.

A Large Factory equipped with up-to-date machinery is at your service to furnish "WHAT YOU WANT"— WHEN YOU WANT IT."

YOUR ENQUIRIES SOLICITED

Orillia Ontario Canada

SPECIAL DRY STOCK

60,000 ft.	5/4	Basswood
400,000 ft.	4/4	Birch Selects & No. 1 Common
200,000 ft.	8/4	Birch No. 1 C & B
200,000 ft.	16/4	Birch No. 1 C & B 12" average.

EDWARD CLARK & SONS LIMITED

807-9 BANK OF HAMILTON BUILDING - TORONTO, Ontario

SOUTHERN HARDWOODS

Dry Lumber in Buffalo for Quick Shipment

BROWN ASH

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
1 in.	40,900	850	24,000	33,000
1¼ in.	53,500	7,300	36,200	15,300
1½ in.	36,500	200	35,000	7,500
2 in.	20,500	....	27,000	8,000

WHITE ASH

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
¾ in.	1,775	....	2,100	1,800
1 in.	35,300	730	12,400	23,000
1¼ in.	120,000	4,500	105,000	22,000
1½ in.	32,900	800	43,000	68,000
2 in.	38,300	500	72,000	96,000
2½ in.	40,500	....	51,000	37,500
3 in.	60,500	....	24,500	38,500
4 in.	25,000	....	14,000	10,500

BASSWOOD

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
1 in.	111,700	4,000	339,000	360,000
1¼ ln.	84,300	14,000	262,500	45,800
1½ in.	61,600	280	23,800	3,000
2 in.	72,000	....	21,000	4,500
2½ in.	90,000	....	13,900	16,000
3 in.	13,550	....	9,500	7,9000
4 in.	1,300	....	1,650	....

BEECH

		1 & 2	No. 1 Com.	No. 2 Com.
⅜ in.	.....	.....	.....	.....
¾ in.	.....	58,900	85,400	1,000
1 in.	.....	14,000	135,700	.....
1¼ in.	.....	33,200	12,600	16,000
1½ in.	.....	60,800	6,000	5,400
2 in.	.....	27,000	51,000	31,000
2½ in.	.....	200	150	375
3 in.	.....	1,100	4,000	5,500
4 in.	.....	225	1,200	475

RED BIRCH

	1 & 2
1 in.	26,100
1¼ in.	46,700
1½ in.	99,400
2 in.	114,400
2½ in.	700
3 in.	10,800
4 in.	12,000

SAP BIRCH

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
1 in.	125,200	12,700	431,000	213,600
1¼ in.	15,800	2,300	53,500	19,000
1½ in.	213,000	6,200	143,000	44,000
2 in.	185,000	.....	160,400	50,500
2½ in.	230,800	.....	137,000	59,100
3 in.	58,550	.....	77,000	71,600
4 in.	35,000	.....	13.500	9,000
5 in.	6,000	.....	1,000	500

BUTTERNUT

		1 & 2	No. 1 Com.	No. 2 Com.
1 in.	.....	5,300	60,800	2,600
2 in.	.....	7,400	.....	2,000
2½ in.	.....	3,000	3,000	.....

CHERRY

	1 & 2	Strips Clear	Com. No. 1	Com. No. 2
1 in.	175,000	.....	227,200	70,500
1¼ in.	7,500	.....	33,600	5,500
1½ in.	12,000	.....	47,700	36,300
2 in.	8,000	.....	33,200	64,900
2½ in.	6,500	.....	3,300	2,200
3 in.	25,750	.....	4,500	3,300
4 in.	5,900	.....	.....	400

CHESTNUT

	1 & 2	Strips Clear	Com. No. 1	S. W. & Com. No. 2
¾ in.	1,000	.....	51,000	103,000
1 in.	12,600	660	5,200	79,500
1¼ in.	151,800	300	80,200	199,200
1½ in.	65,500	.....	42,000	.....
2 in.	22,200	.....	17,300	126,200
2½ in.	4,000	.....	1,500	500
3 in.	2,100	.....	1,300	500
4 in.	1,500	.....	300	.....

CYPRESS

		1 & 2	Select	No. 1 Shop
1 in.	.....	7,200	14,100	9,000
1¼ in.	.....	.....	7,000	.....
1½ in.	.....	9,100	.....	.....
2 in.	.....	12,000	13,500	16,600
2½ in.	.....	7,000	.....	.....
3 in.	.....	57,400	31,100	12.000
4 in.	.....	.....	.....	.....

SOFT ELM

		1 & 2	No. 1 Com.	No. 2 Com.
1 in.	.....	3,700	19.550	19,900
1¼ in.	.....	41,500	38,200	6,800
1½ in.	.....	8,500	11,300	7,400
2 in.	.....	9,000	18,000	34,500
2½ in.	.....	2,000	6,200	9.300
3 in.	.....	14,280	19,000	10,000
4 in.	.....	8,100	6,200	6,000

ROCK ELM

		1 & 2	No. 1C	No. 2C
2½ in.	.....	12,700	7,000	2,200

Also Large Stocks of Ash, Basswood, Beech, Birch, Hard and Soft Maple.

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MANUFACTURERS SOUTHERN HARDWOOD LUMBER

Yards: BUFFALO, N.Y. Mills: KNOXVILLE, TENN.; FONDE, KENTUCKY

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Will make attractive prices for 4/4 Birch and Elm; immediate shipment. Also have good stock in all thicknesses, Soft & Hard Maple, Ash, and Basswood. Write us for quotations.

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OHIO and INDIANA
KENTUCKY and WEST VIRGINIA
NORTHERN BIRCH and MAPLE
SOUTHERN GUM, COTTONWOOD

306 Ulmer Bldg., Cleveland, Ohio

L. D. LEACH & COMPANY

FISHER BUILDING, - CHICAGO, Ill.

Manufacturers Hardwood Lumber

6 Cars 4/4 No. 1 Common Red and White Oak
5 Cars 4/4 No. 2 Common Red and White Oak
4 Cars each 8/4 in. No. 1 and No. 2 Com. R. and W. Oak
2 Cars each 10/4 in. and 12/4 in No. 1 and No. 2 Common Red and White Oak

Oak Furniture — Vehicle and Car Stock Dimensions Sawed to Order

4/4 in. Gum—All Grades
4/4 in. Cypress—All Grades
4/4 in., 8/4 in. and 10/4 in. Log Run Soft Elm

HARDWOOD LUMBER

THIRTEEN BAND MILLS
SIX PLANING MILLS
ELEVEN FLOORING UNITS
NINE DIMENSION MILLS

ANNUAL CAPACITY:
130,000,000 feet.

THE WAY TO RESUME IS TO RESUME

Few topics have been so witlessly discussed as those having to do with post-war conditions, industrial resumption and price re-adjustments.

Every theory, idea and ism, however absurd, ridiculous and impossible, seemingly have found exponents, who have had only too ready an access to the channels of printed communication.

Communism, socialism, syndicalism, bolshevism in their purity and in every range of mixture, and by every device of camouflage have been served to the public.

The principal achievement registered has been expensive, hurtful, unnecessary delay.

One has waited for one thing, and another for another, the result being that few or none have got what they waited for,—the effect usually being that where one waited, he enforced a wait upon others.

Where one wheel is not turning, usually the whole machine is at a standstill.

If everyone waits for everything to get just right, all will wait forever.

Full activity upon a full program with full confidence that all will come out well, is the route by which to secure the surest, quickest return to complete normality.

The way to get others to resume is to resume ourselves.

Such is our policy; and we are aiding all our customers in this course by superior products, efficient service, and a genuine interest always in filling their requirements.

W. M. Ritter Lumber Co., Columbus, Ohio

Canadian Representative: John Hall, 160 Huron St., Post Office Box 32, Toronto

The Door Carrier System

Makes your dry-kiln doors steam-tight and saves time, heat, trouble and money.

Carrier lifts door clear of kiln and carries it down track. Returning, deposits door to rabbeted joint, where it is held steam-tight by its own weight. Applicable to old or new kilns.

Ask for catalogue.

DRY KILN
DOOR CARRIER CO.
1117 Cornell Ave.
INDIANAPOLIS, IND.

William S. Whiting Company

JOHNSON CITY, TENNESSEE

1 Band Mill *5 Circular Mills*

Hardwood Lumber

Oak	Basswood
Maple	Buckeye
Chestnut	Poplar
Ash	Birch

Rotary-Cut Soft Yellow Poplar Veneers
Quarter-Sawn White Oak Flitches
Sliced and Sawn Quartered White Oak Veneers
Oak and Maple Flooring
Dowel Pins and Dowel Rods
Glued-Up Chestnut Cores and Dimension

5-16" Oak Parquetry Flooring Strips and Squares carried in stock at our warehouses:
138 44th St., Brooklyn, N.Y., and at Elizabethton, Tenn.

BLACK BROS. CLAMPS

Where Black Bros. Clamps are known, there is no second choice. Know them.

Carried in stock by leading dealers throughout Canada. Write for Bulletin, and name of nearest dealer.

The Black Bros. Co. - Mendota, Ill., U.S.A.

Peytona Lumber Co. Inc.

HUNTINGTON, W. VA.

BAND MILLS OMAR, CHRISTIAN LOGAN COUNTY, W. VA.

Band Sawed West Virginia Hardwoods

WHITE OAK	BASSWOOD
RED OAK	MAPLE
CHESTNUT	BEECH
POPLAR	HICKORY

Our own facilities for Surfacing, Resawing and Kiln Drying

Arkla Lumber & Mfg. Company

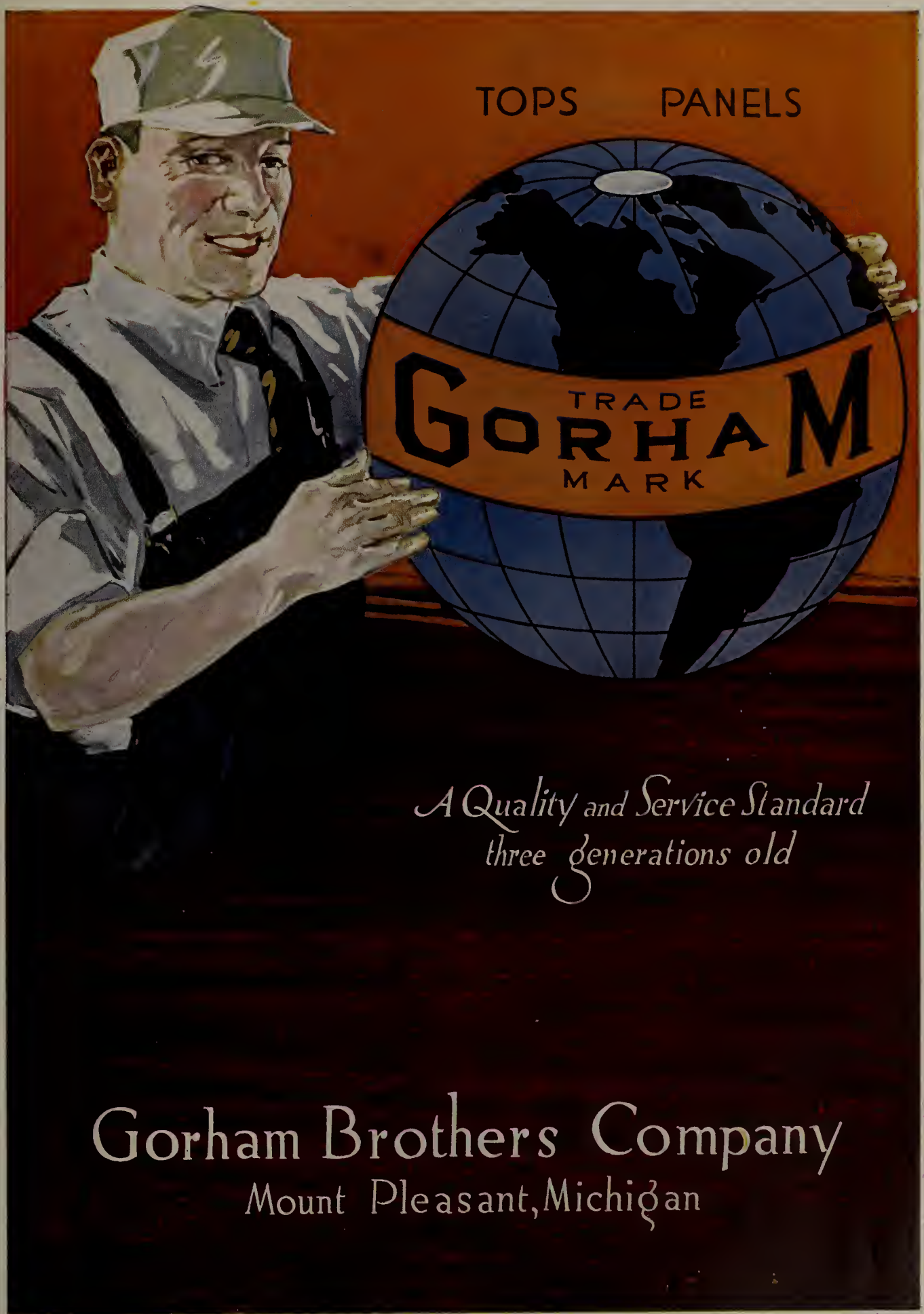
Main Office: - St. Louis, Mo.

Manufacturers and Wholesalers

Ash—Plain and Qtd. White and Red Oak Poplar, Cypress, Gum

In addition to stocks at Mill, we carry a well assorted dry stock of all items on our St. Louis yard available for immediate shipment. Write or wire us (our expense) for quotations.

F. HUNTINGTON SMITH
Canadian Representative


TOPS PANELS
TRADE
GORHAM
MARK
A Quality and Service Standard
three generations old
Gorham Brothers Company
Mount Pleasant, Michigan

A Quality and Service Standard Three generations old

Gorham products are the result of years and years of intelligent effort to satisfy the exacting demands of manufacturers of high grade furniture.

You can maintain the highest quality standard if you use Gorham Tops, Panels, Desk Beds and other built-up stock.

TRADE GORHAM MARK

Gorham Brothers Co.

Mount Pleasant, Mich.

Mercerau-Hawkins Tie Company

Huntington - W. Va.

Manufacturers and Wholesale Dealers

West Virginia and Southern

HARDWOODS

We specialize in

Oak Tie Siding
White and Red Oak
Yellow Poplar
Basswood
Chestnut and
Gum Lumber.

Canadian Sales in Charge of

C. W. PETERS

Vice President and Manager of Lumber Dept.

RUSH LUMBER COMPANY

Manufacturers Southern Hardwoods

Band Mill and Office - Memphis, Tenn.

ASH
2 cars 5/4 No. 2 Com. & Btr.

CYPRESS
1 car 4/4 Shop & Btr.

ELM
3 cars 6/4 Log Run
1 car 8/4 Log Run
1 car 12/4 Log Run

PLAIN RED GUM
1 car 4/4 Com. & Btr.
1 car 5/4 Com. & Btr.
2 cars 4/4 No. 1 Common
2 cars 4/4 No. 2 Common

QTD. RED GUM
2 cars 4/4 No. 1 Common
1 car 6/4 F.A.S.
1 car 6/4 No. 1 Common
1 car 8/4 Com. & Btr.

QTD. RED GUM S.N.D.
2 cars 8/4 No. 1 & Btr.
1 car 10/4 No. 1 & Btr.
1 car 12/4 No. 1 & Btr.

PLAIN SAP GUM
1 car 4/4 F.A.S.
3 cars 4/4 No. 1 Com.
3 cars 4/4 No. 2 Com.
2 cars 4/4 No. 3 Com.
1 car 5/4 Com. & Btr.
2 cars 5/4 No. 2 Com.
1 car 5/4 No. 3 Com.

QTD. BLACK GUM
3 cars 4/4 No. 1 Com. & Btr.
1 car 4/4 No. 2 Com.

PLAIN BLACK GUM
1 car 4/4 Log Run

HICKORY
1 car 6/4 Log Run

QTD. WHITE OAK
2 cars 4/4 No. 1 & Btr.
3 cars 4/4 No. 1 Com.
1 car 4/4 No. 2 Com.
1 car 4/4 2½ to 5½ Cl. Strips
1 car 4/4 1½ to 3 Com. Strips.
2 cars 5/4 No. 1 & Btr.
1 car 6/4 No. 1 Com.

PLAIN WHITE OAK
3 cars 4/4 No. 1 Com.,
1 car 4/4 No. 2 Com.
1 car 4/4 No. 1 Com. & Btr. Sound Wormy
1 car 5/4 No. 1 Com. & Btr.
1 car 5/4 No. 1 Com.
1 car 6/4 No. 1 Com.
1 car 5&6/4 No. 3 Com.

PLAIN RED OAK
3 cars 3/4 No. 1 Com. & Btr.
1 car 4/4 No. 1 Com. & Btr.
3 cars 4/4 No. 1 Com.
2 cars 4/4 No. 2 Com.
2 cars 5/4 No. 1 Com. & Btr.
1 car 5/4 No. 1 Com.
1 car 6/4 No. 1 Com. & Btr.

POPLAR
1 car 4/4 F.A.S.
1 car 4/4 Saps & Select
2 cars 4/4 No. 1 Com.
2 cars 4/4 No. 2 Com.
1 car of Dogboards.

Dacus-Richards Hardwood Co.

A. P. DACUS - H. J. RICHARDS

MANUFACTURERS

Southern Hardwood

Specializing in

RED GUM
SAP GUM

PLAIN AND QUARTERED

OAK

Randolph Building,
Memphis, Tennessee.

Mills at EVANSVILLE, Miss., and PRITCHARD, Miss.

Perkins Brothers

Kelso, Ark.

Manufacturers of

Southern Hardwoods

Quartered and Plain White Oak, Plain Red Oak, Gum Elm, Maple, Ash and Cypress

We are also prepared to cut dimension stock to order in Ash, Oak, Gum, Hickory and Elm.

Let us know your requirements.

Sawed Veneer

Quartered White Oak
For Furniture and Panels

Plain Red Oak
For Interior Trim and Doors

Cypress
For Battery Separators

Manufacturing Uniformly Good.
Quality Unsurpassed

James E. Stark & Co., Inc.
MEMPHIS, TENN.

BEDNA YOUNG
Lumber Company

Jackson - Tennessee

Manufacturers of

Quartered White Oak
Quartered Red Oak
and Other Hardwoods

When in the market for

High Grade Lumber

please let us have your enquiries.

Sales Office: 610 Lombard Bldg.
Indianapolis, Indiana

OAK FMA

MEMPHIS BRUCE LITTLE ROCK

EXPONENTS
of
Highly Perfected
Manufacture
and
Merchandising Service
in
Arkansas Hardwoods
Including
Band Sawn
White and Red Oak
Ash — Gum
and
***Bruce* OAK FLOORING**
THE BEST *Oak Flooring*
Including
Square Edged
Parquetry Strips

Inquiry and Correspondence Invited

E. L. BRUCE COMPANY
MANUFACTURERS
MEMPHIS, TENNESSEE
Flooring Plants: LITTLE ROCK—MEMPHIS
Band Mill: LITTLE ROCK

Look for this Brand

B.H.

on the end of each Board

It Means Satisfaction

BROWN & HACKNEY, Inc.

Manufacturers of High Grade Southern Hardwood

LUMBER

Band Mill: Little Rock, Ark. *Offices: Memphis, Tenn.*

Eastern Representative

Chas. T. McManus, 307 Brisbane Bldg., Buffalo, N.Y.

A High Standard of Quality and Service

The Big Opportunity Is Here

TO the manufacturer, the fact that present prices are lower than production costs, should be an incentive to stock up in Hardwoods before a sudden demand arises to snatch the opportunity away.

We need only point to the market reports to emphasize that prices will **not** be lower.

For the factory trade, we are enabled to ship at short notice any quantity of **Birch, Basswood,** or **Hard Maple.**

Anticipate the upward trend—get our quotations now.

Sawyer Goodman Company

Marinette - Wisconsin

Stimson Veneer and Lumber Co.

(Inc.)

Office and Mill: McLean Ave. and Union Belt R.R.

Memphis - Tenn.

We sell only the product of our own mills and make band sawn lumber in all Southern Hardwoods.

We specialize in Quartered White Oak, Red Oak, and Red Gum.

With allied companies we make fifty million feet annually.

J. V. Stimson Hardwood Co.

Manufacturers and Exporters

Band Mills: Memphis, Tenn., Helena, Ark.

Memphis - Tenn.

STOCK LIST

QUARTERED WHITE OAK
- 3 cars 4/4" 1s and 2s.
- 5 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common .

QUARTERED RED OAK
- 5 cars 4/4" 1s and 2s.
- 10 cars 4/4" No. 1 Common.
- 4 cars 4/4" No. 2 Common.
- 2 cars 6/4" No. 1 Common and Better.

QUARTERED RED GUM
- 10 cars 4/4" 1s and 2s.
- 3 cars 4/4" 1s and 2s Fig.
- 2 cars 5/4" 1s and 2s.
- 2 cars 6/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 2 cars 5/4" No. 1 Common.
- 2 cars 6/4" No. 1 Common.

QUARTERED RED GUM, Sap no Defect
- 5 cars 6/4" No. 1 Common and Better.
- 10 cars 8/4" No. 1 Common and Better.

ASH
- 4 cars 10/4" No. 1 Common and Better.
- 1 car 12/4" No. 1 Common and Better.
- 1 car 6/4" No. 1 Common and Better.
- 2 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common.

SAP GUM
- 10 cars 4/4" 1s and 2s.
- 20 cars 4/4" No. 1 Common.
- 10 cars 4/4" No. 2 Common.
- 2 cars 4/4" 18" up Panel.
- 5 cars 4/4" 13-17" Box Boards.

PLAIN RED OAK
- 2 cars 4/4" 1s and 2s.
- 2 cars 6/4" No. 1 Common and Better.
- 2 cars 10/4" No. 1 Common and Better.

PLAIN WHITE OAK
- 4 cars 4/4" No. 1 Common Plain.

COTTONWOOD
- 2 cars 4/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 5 cars 4/4" No. 2 Common.

ELM
- 2 cars 4/4" Log Run.
- 10 cars 10/4" Log Run.
- 10 cars 12/4" Log Run.

MAPLE
- 4 cars 12/4" Log Run.

THE above photograph was taken at one of our logging camps and illustrates the up-to-date equipment used in all our operations from the stump to the lumber on our yards.

The five Oak logs shown on the trailers are each 12 feet long and were all cut from one tree, the butt cut measured fifty-one inches in diameter. These five logs measured 6,489 feet.

We operate two modern band mills on our own timber, and manufacture all the lumber we ship, which enables us to furnish stock of even grade, color and texture.

We will appreciate an opportunity of serving you and will be pleased to quote you at all times.

Manufacturers of all kinds of high grade Southern Hardwoods.

DIRECT FROM PRODUCER TO CONSUMER

GAYOSO LUMBER COMPANY

MEMPHIS, TENNESSEE, U.S.A.

Canadian Representative: W. R. Youmans, 972 College Street, Toronto, Ontario
Telephone Parkdale 6751 W.

WHEELER - TIMLIN LUMBER CO.

WAUSAU, Wisconsin.

You cannot beat the Birch for an all round wood for the furniture manufacturer. We have BEAUTIFUL BIRCH in all standard thicknesses from 4/4″ to 10/4″ and all grades. Write us for delivered prices.

Mills at DORCHESTER, Wis., and WITTENBERG, Wis.

F. T .DOOLEY, President. T. E. JONES, Secy.-Treas.

F. T. Dooley Lumber Co.
Inc.

MANUFACTURERS and WHOLESALERS of

SOUTHERN HARDWOODS

Plain and Quartered Oak
Cypress, Gum, Ash
Soft Maple and Elm

Send us your inquiries

Memphis ∴ ∴ Tennessee

Chas. F. Luehrmann Hardwood Lumber Co.

Manufacturers and Wholesalers of

Hardwood and Yellow Pine Lumber

Office and Yard: 148 Carroll St. St. Louis, Mo.

Hardwood and Yellow Pine for Immediate Shipment from Stock

Complete Stock of Built Up Panels
3 and 5 Ply—Carried in Stock at St. Louis

FIR DRAWER BOTTOMS
FIR DOOR PANELS

Write us for our Stock and Price List

Aromatic Tennessee Red Cedar

CAR LOAD LOTS
OR LESS

Earthman Lumber Co.
Murfreesboro, Tenn.

Quality plus Service
AT RIGHT PRICES

Let us quote you on concave chair seat, turned office, piano, restaurant and bath-room stool tops.

Solid table tops, cabinet work; in fact woodwork of all description.

Algoma Wood Products Co.
ALGOMA, WIS.

Band Sawn Poplar, Plain and Quartered White and Red Oak— Quartered Red Gum, Sap No Defect

Below we offer, subject to prior sale and immediate acceptance, the following stock:—

ASH

4/4"	Log Run	20,000 ft.
5/4"	Log Run	4,000 "
6/4"	Log Run	2,000 "
8/4"	Log Run	5,000 "

BASSWOOD

4/4"	No. 2 Com. & Btr.	35,000 "

BEECH

4/4"	Log Run	10,000 "
8/4"	Log Run	40,000 "
10/4"	Log Run	10,000 "
12/4"	Log Run	3,000 "

COTTONWOOD

4/4"	Log Run	10,000 "

QTRD. GUM, SND

4/4"	No. 2 Com. & Btr.	7,500 "
6/4"	FAS	20,000 "
6/4"	No. 1 Com.	40,000 "
8/4"	No. 1 Com.	30,000 "

PLAIN SAP GUM

4/4"	No. 1 Com.	45,000 "
4/4"	No. 2 Com.	30,000 "
5/4"	No. 1 Com. & Btr.	30,000 "

QTRD. BLACK GUM

4/4"	No. 2 Com. & Btr.	45,000 "

PLAIN BLACK GUM

4/4"	No. 1 Com. & Btr.	15,000 "

HICKORY

6/4"	Log Run	2,000 "
8/4"	Log Run	12,000 "

QTRD. WHITE OAK

4/4"	FAS	15,000 ft.
4/4"	No. 1 Com.	84,000 "
4/4"	No. 2 Com.	74,000 "
5/4"	Com. & Btr.	10,000 "

MAGNOLIA

4/4"	FAS	4,000 "
4/4"	No. 1 Com.	50,000 "
4/4"	No. 2 Com.	45,000 "

QTRD. WHITE OAK STRIPS

4/4"	Clr 2½ to 5"	13,000' "
4/4"	Com. 2 to 3"	3,500 "

PLAIN WHITE OAK

4/4"	No. 1 Com.	15,000 "
4/4"	No. 2 Com.	49,000 "

QTRD. RED OAK

4/4"	No. 1 Com.	60,000 "
4/4"	No. 2 Com.	12,000 "

PLAIN RED OAK

4/4"	FAS	48,000 "
4/4"	No. 1 Com	70,000 "
4/4"	No. 2 Com.	74,000 "
5/4"	FAS	30,000 "
5/4"	No. 1 Com.	20,000 "

PLAIN OAK

4/4"	Sound Wormy	78,000 "
4/4"	No. 3 Com.	83,000 "

POPLAR

4/4"	No. 1 Com.	200,000 "
4/4"	No. 2A & B Com.	220,000 "
6/4"	No. 1 Com. & Btr.	33,000 "

SYCAMORE

6/4"	Log Run	21,000 "

We own our stumpage and operate our own band mill in Bude, Miss., manufacturing ten million feet annually, on which we specialize in Quartered White Oak, manufactured from genuine forked leaf White Oak and Yellow Poplar of fine soft texture grown in the hills of Southern Mississippi.

Our grades are dependable and the manufacture of our stock is unsurpassed. We respectfully solicit your enquiries, which will receive our prompt and courteous attention.

L. D. Murrelle Lumber Company

General Sales Office: 1524 Exchange Bldg., Memphis, Tennessee

Band Mill: Bude, Miss.

Reese Sheriff Lumber Co.

WILLIAMSPORT, PENNSYLVANIA

Manufacturers of

Northern and Southern Hardwoods White Pine, Spruce and Hemlock

With special attention to **Oak, Chestnut, Poplar, Cherry, Walnut, Gum and Basswood.**

OUR MOTTO

REASONABLE PRICES—that you can afford to pay.
EFFICIENT SERVICE — that you have a right to expect
FAIR TREATMENT — that you can depend on getting

We would appreciate an opportunity of furnishing a portion of your lumber requirements.

TO MEET COMPETITION

It will be necessary to put better lumber into your product. Indiana Oak is known to be the best. It costs no more than the other kinds—then why not get it?

We are the largest manufacturers of hardwoods in Indiana and give you below a partial list of the stock that we have ready for shipment:

INIDIANA QUARTERED WHITE OAK

	1s&2s	No. 1 C.	No. 2 C.
1/2"	1 car	1 car	
5/8"	2 "	4 "	
3/4"	1 "	5 "	1 car
4/4"	3 "	4 "	4 "
5/4"	1 "	3 "	1 "
6/4"	1 "	3 "	
8/4"	1 "	2 "	

Also Clear and No. 1 Common Quartered White Oak Strips.

INDIANA QUARTERED RED OAK

	1s&2s 6"&up	1s&2s 9"&up	No. 1 C.	No. 2 C.
1/2"	3500'			
5/8"	1 car		1 car	
4/4"	3 "	1 car	3 "	1 car
5/4"	2 "	1 "	2 "	
6/4"	2 "	2500'	1 "	
7/4"	1 "	4500'		
8/4"	2000'	3000'	1 "	

PLAIN WHITE OAK

	1s&2s	No. 1 C.	No. 2 C.
5/8"	1 car	1 car	
3/4"		4000'	
4/4"	2 cars	4 cars	2 cars
5/4"	1 "	3 "	1 "
6/4"	1 "	2 "	
8/4"	3 "	2 "	
2½"	½ "	1 "	

PLAIN RED OAK

	1s&2s	No. 1 C.	No. 2 C.
5/8"	2 cars	2 cars	
3/4"		5000'	
4/4"	4 cars	4 cars	3 cars
5/4"	1 "	3 "	
6/4"	1 "	4 "	
8/4"	2 "	3 "	
2½"	2 "	3 "	

BLACK WALNUT—Steamed Stock

	1s&2s	No. 1 C.	No. 2 C.
4/4"	1 car	3 cars	12000'
5/4"	1 "	1 "	9000'
6/4"	4000'	4000'	
8/4"	1 car		

1 car 5/8" Log Run, not steamed.

WE ARE IN POSITION TO KILN DRY THIS LUMBER. ASK FOR OUR RATES.

We also have good stocks of Poplar, Ash, Beech, Hickory, Maple, Gum, Tupelo, etc.—Write us for prices.

Maley & Wertz Lumber Company

EVANSVILLE, INDIANA

30 Million Feet Hardwoods Yearly

Manufactured by

Darnell-Love Lumber Co.

Leland, Mississippi

We own and operate two large band mills with sufficient timber to supply these mills, at present capacity, fifteen to twenty years

Cutting

Oak, Ash, Gum, Elm

Cypress, Cottonwood

and various other Native Woods

Our Specialties are—

3/8", 1/2", 5/8" and 3/4" in Gum and Oak

and

8/4" Quartered Red Gum

8/4" Quartered Red Gum Sap No Defect

WE SOLICIT YOUR INQUIRIES AND ORDERS

E. SONDHEIMER CO.

MEMPHIS, TENN., U.S.A.

Band Mills at
Baton Rouge, La., Sondheimer, La., Tallulah, La.
Office & Distributing Yard, Memphis, Tenn.

Manufacturers of Southern Hardwoods — Dry Stock Ready for Shipment

Ask us for prices. We may be able to save you some money. We specialize in genuine Tensas Basin Red Gum—best in the world.

WHITE ASH
1 car each 1", 1¼", 1½" 1s&2s
2 " 2" 1s & 2s
7 " 1" No. 1 Com. & Sel.
3 " 1¼" No. 1 Com. & Sel.
1 " 1½" No. 1 Com. & Sel.
3 " 2" No. 1 Com. & Sel.
1 " each 2½" & 3" ditto
5 " 1" No. 2 Common
2 " 2" No. 2 Common
1 " 2½, 3½, 4" No. 2 Cm.

COTTONWOOD
5 " 1" 1s&2s
1 " 1½" 1s&2s
10 " 1" No. 1 Common
5 " 1¼" No. 1 Common
5 " 1½" No. 1 Common
3 " 1" No. 2 Common
4 " 1¼" No. 2 Common
10 " 1½" No. 2 Common
2 " 1x 9 to 12" Box Bds.
2 " 1x13 to 17" Box Bds.

CYPRESS
1 " 1" Shop
2 " 1" No. 1 Common
1 " each 1x 4, 1x 8", No. 1 Com.
1 " each 1x10, 1x12", No. 1 Com.
1 " 1" Pecky

SOFT ELM
2 " 1½" Log Run
5 " 2" Log Run

PLAIN SAP GUM
10 " each 1" & 1¼" 1s&2s
15 " 4/4" No. 1 Common
2 " 5/4" No. 1 Common
15 " 4/4" No. 2 Common
10 " 5/4" No. 2 Common
5 " 4/4" No. 3 Common

BLACK GUM
1 " 1" Log Run

PECAN
3 " 6/4" Log Run
4 " 8/4" Log Run

MAGNOLIA
2 " 1" No. 2 Common
1 " 1" No. 2 Common

QRTD. RED GUM
5 " 1" 1s&2s
3 " 1¼" 1s&2s
2 " 2" 1s&2s
1 " each 2½ & 3" 1s&2s
8 " 1" No. 1 Common
3 " each 1¼ & 2" No. 1 C.

QRTD. RED GUM
(Sap No Defect)
10 " 1" 1s&2s
1 " 1½" 1s&2s
3 " 2" 1s&2s
5 " 1" No. 1 Common
3 " each 1¼ & 2 "No. 1 C.

QRTD. WHITE OAK
3 " 1" No. 1 Common
1 " 1" No. 2 Common

QRTD. RED OAK
3 " 1" 1s&2s
5 " 1" No. 1 Common
2 " 1" No. 2 Common

PLAIN WHITE OAK
1 " 3/4" 1s&2s
1 " 3/4" No. 1 Common
6 " 4/4" No. 1 Common
5 " 4/4" No. 2 Common

PLAIN RED OAK
2 " each 1" & 1¼" 1s&2s
15 " 1" No. 1 Com. & Sel.
1 " 1¼" No. 1 Com. & Sel.
10 " 1" No. 2 Common
1 " 1¼" No. 2 Common
5 " 1" Sound Wormy
8 " 1" No. 3 Common

QRTD. TUPELO
1" 1s&2s

PLAIN-SAWN TUPELO
6 " 1" 1s&2s
10 " 1" No. 1 Common
5 " 1" No. 2 Common
1 " 1" No. 3 Common
1 " 1x13 to 17" Box Bds.

WILLOW
8 " 1" 1s&2s
5 " 1¼"1s&2s
1 " each 1½ & 2" 1s&2s
15 " 1" No. 1 Common
8 " 1¼" No. 1 Common
1 " 1½" No. 1 Common
10 " 1" No. 2 Common
8 " 1¼" No. 2 Common
10 " 1½" No. 2 Common
5 " 2" No. 2 Common
1 " 1x13 to 17" Box Bds.

Lumber
Walnut, Mahogany Plain and Quartered Oak, Ash, Cherry

Veneers
Walnut and Mahogany

WE specialize in AMERICAN BLACK WALNUT and can furnish straight cars from 3/8 to 4 inches in thickness. Also can load mixed cars WALNUT and MAHOGANY LUMBER and VENEERS, PLAIN and QUARTERED RED and WHITE OAK, ASH and CHERRY.

The Kosse, Shoe and Schleyer Co.

Eastern Branch:
BALTIMORE, Md.

Main Office and Band Mill:
CINCINNATI, Ohio

American Walnut Lumber

QUALITY

SERVICE

More evidence of our untiring efforts to procure the very best raw material for our product.

All Grades and Thicknesses

Pickrel Walnut Company

St. Louis, Missouri

Nichols & Cox Lumber Co.

GRAND RAPIDS - MICHIGAN

We can ship promptly the following items. Can also kiln dry if desired.

2 cars	4/4	1st and 2nd	Sap Gum
5 "	4/4	No. 1 Com.	"
3 "	5/4	No. 1 Com. and Better	"
2 "	6/4	"	"
2 "	8/4	"	"
4 "	6/4	"	Qtd Sap Gum
5 "	8/4	"	"
3 "	10/4	"	"
2 "	12/4	"	"
2 "	4/4	"	Plain Red Gum
1 "	5/4	"	"
1 "	6/4	"	"
1 "	8/4	"	"
2 "	4/4	1st and 2nd	Plain Red Oak
3 "	4/4	No. 1 Com.	"
1 "	5/4	No. 1 C & B	"
1 "	6/4	"	"
1 "	8/4	"	"
1 "	4/4	1st and 2nd	Plain White Oak
2 "	4/4	No. 1 Com.	"
2 "	10/4	No. 1 Com. and Better	Birch
1 "	12/4	"	"
1 "	10/4	"	Basswood
5 "	6/4	No. 2 Com. and Better	Gray Elm
5 "	4/4 to 8/4	No. 1 Com. and Better End Dried	White Maple

Send us your enquiries for anything needed in Northern and Southern Hardwoods.

DIMENSION

My Specialty is

Dimension Lumber

For Manufacturers of

Wagons and Implements, Buggies and Autos, Furniture, Railroad Car and Track Material

Standard Sizes on Hand for Prompt Shipment. Special Sizes Cut to Order

SOUTHERN HARDWOOD LUMBER

C. B. COLBORN

438 Randolph Building

MEMPHIS - TENN.

"The Canada Lumberman" is published in the interest of, and reaches regularly, persons engaged in the lumber, woodworking and allied industries in every part of Canada. It aims at giving full and timely information on all subjects touching these interests, and invites free duscussion by its readers.

Advertisers will receive careful attention and liberal treatment. For manufacturing and supply firms wishing to bring their goods to the attention of owners and operators of saw and planing mills, woodworking factories, pulp mills, etc., "The Canada Lumberman" is undoubtedly the most direct and profitable advertising medium. Special attention is directed to the "Wanted" and "For Sale" advertisements. Sample copy and full information on request. Head Office, 349 Adelaide St. West, Toronto.

Per year $3 in Canada

Canada Lumberman

founded 1880

Mailed twice monthly

Toronto Montreal

The National Lumber Journal for Forty Years

Winnipeg Vancouver

CHAPMAN and DEWEY LUMBER CO.

Manufacturers

Band Sawn — Carefully Graded

FURNITURE STOCK

10 Cars 5/4" FAS and No. 1 Com. Sap Gum
5 Cars 4/4" No. 1 Com. and Selects Sap Gum
3 Cars 4/4" No. 1 Com. and Selects Red Gum
5 Cars 4/4" No. 1 Com. and Selects Pl. Red Oak
2 Cars 4/4" No. 1 Com. and Selects Pl. White Oak

Also fully assorted stock in Ash, Soft Maple, Elm, Cypress, Cottonwood. We can save you freight by shipping stock, surfaced and resawn. We will gladly quote you delivered prices, payable Canadian funds.

Chapman and Dewey Lumber Co.
KANSAS CITY, Mo. MARKED TREE, Ark.

DRY STOCK

For Immediate Shipment

	SOFT ELM	
6905′	1″	—No. 1 C&B
3195′	1″	—No. 2 Com.
41030′	1½″	—No. 1 C&B
2356′	1½″	—No. 2 Com.
56880′	2″	—No. 1 C&B
10046′	2″	—No. 2 Com.
110594′	2½″	—No. 1 C&B
26985′	2½″	—No. 2 Com.
11750′	3″	—No. 2 Com.
	WHITE ASH	
87846′	2″	—No. 1 C&B
3072′	2″	—No. 2 Com.
139960′	2½″	—No. 1 C&B
13537′	2½″	—No. 2 Com.
18992′	3″	—No. 1 C&B
608′	3″	—No. 2 Com.
	HICKORY	
650′	1″	—No. 1 C&B
1408′	2″	—No. 1 C&B
	COTTONWOOD	
1620′	1″	—No. 1 C&B
19956′	2″	—No. 1 C&B
1196′	2″	—No. 2 Com.
	BLACK WALNUT	
2873′	1″	—No. 1 C&B
1151′	1″	—No. 2 Com.
	WILLOW	
1446′	1″	—No. 1 C&B
	CHERRY	
4747′	1″	—No. 1 C&B
2137′	1″	—No. 2 Com.
	ROCK ELM	
12493′	2″	—No. 1 C&B
	SOFT MAPLE	
14397′	2½″	—No. 1 C&B
	BASSWOOD	
1549′	1″	—No. 1 C&B
606′	2″	—No. 1 C&B
	BUTTERNUT	
2584′	1″	—No. 1 C&B
	HARD MAPLE	
31788′	1″	—No. 1 C&B
243927′	1¼″	—No. 1 C&B
227707′	1½″	—No. 1 C&B
1796′	1½″	—No. 2 Com.
217401′	2″	—No. 1 C&B
11410′	2″	—No. 2 Com.
38016′	2½″	—No. 1 C&B
11091′	3″	—No. 1 C&B
2796′	4″	—No. 1 C&B
	BEECH	
3000′	1½″	—No. 2 Com.
500′	2″	—Log run
250′	2½″	—Log run
350′	3″	—Log Run
100′	4″	—Log run
	BIRCH	
15998′	1″	—No. 1 C&B
22311′	1¼″	—No. 1 C&B
11748′	1½″	—No. 1 C&B
50157′	2″	—No. 1 C&B
87172′	2½″	—No. 1 C&B
7866′	3″	—No. 1 C&B
	PLAIN OAK	
9369′	1″	—No. 1 C&B
1107′	2″	—No. 1 C&B

The above stock is in our Battlecreek yard and we are so located that we can load and ship stock immediately upon receipt of your orders. We guarantee National Hardwood Lumber Association grades.

PAYSON SMITH LUMBER CO.
Plymouth Building - MINNEAPOLIS, Minn.

OAK

Plain and Quartered
Uniform Color—Soft Texture

Poplar, Ash

and other

Hardwoods

We have 35,000,000 feet dry stock—all of our own manufacture, from our own timber grown in Eastern Kentucky

Prompt Shipments

The Mowbray & Robinson Co.
(INCORPORATED)

Manufacturers

Office: CINCINNATI, OHIO

MILLS
Quicksand, Ky.; Viper, Ky.; West Irvine, Ky.

Canadian Representative:
M. E. CUMMINGS, 814 Richmond Ave., Buffalo, N. Y.

West Virginia Oak

Thoroughly Dry, Accurately Sawn, Soft Textured, and Uniform in Color.

Write us when needing choice stocks. All lumber produced from virgin timber of large size and excellent quality.

Twenty Million Feet Hardwood Ready for Immediate Shipment

OAK

Yellow Poplar, Ash, Hickory, Beech, Chestnut, Basswood, Walnut, Maple

THE THOMAS HALL LUMBER COMPANY

Manufacturers

CHARLESTON, - WEST VIRGINIA

M. BROWN, Canadian Repres. **Address: 87 Neville Park Blvd., Balmy Beach, Toronto**

Tallahatchie Lumber Company

MEMPHIS, TENN.

Manufacturers of

Band Sawn Hardwoods

Graded so as to be especially attractive to Furniture Manufacturers.

Careful attention to every detail of service.

SEND US YOUR INQUIRIES

Chas. Gill Lumber Co.

WAUSAU, WISCONSIN

MANUFACTURERS & WHOLESALERS

SPECIALIZING IN

MAPLE BIRCH AND BASSWOOD

Complete Stock Crating Material

We solicit correspondence relative to all Northern Hardwoods

Chicago Office — 501 Lumber Exchange

Band Sawn West Virginia Hardwoods

Our timber, of virgin growth in Greenbrier and Pocahontas Counties, limestone soil, gives a combination of Texture, Quality and Character that is most desirable to the Woodworking trade.

The most critical Hardwood users are among our best accounts. Why?

The W. C. Barlett Lumber Co.

Charleston, W. Va.

A "Quality" you will admire
A "Service" you will appreciate

We have the facilities for giving Canadian Woodworkers and Furniture Manufacturers a prompt service on straight or mixed cars of the following:

Ash, Oak, Gum, Poplar, Hickory, Walnut, Chestnut, Beech, Maple, Elm, Sycamore, Cottonwood.

Soft textured Plain and finely figured Quarter-Sawn Red and White Oak our specialty.

J. V. Stimson & Company

OWENSBORO - KENTUCKY

Bandmills: Owensboro; Campbellsville, Kentucky

D. E. Hewit Lumber Co.

Huntington, W. Va.

MANUFACTURERS

West Virginia Hardwoods

(Not Better than the Best but as Good as the Best)

FAS Plain White and Red Oak
No. 1 Com. Plain White and Red Oak
Implement Oak
Sound Wormy Chestnut
No. 1 Common and Better Chestnut
Hickory Plank
Poplar and Basswood

Thompson-Katz Lumber Co.

Manufacturers of

WHITE ASH EXCLUSIVELY

In dealing with us the wood worker and furniture manufacturer may rightly expect a better service, better value and a greater selection from which to choose his requirements. We have all grades and all thicknesses to offer—beautiful stock that we know will please you. Drop us a card to-day—we'll do the rest.

MEMPHIS, TENNESSEE

J. H. Bonner & Sons

Memphis, Tenn.

Mills:
Jonquil and Ruffwood, Ark.

Manufacturers

Band Sawn Hardwood Lumber

Write or wire for prices on

Gum, Oak, Elm, Etc.

Frank Purcell Walnut Lumber Co.

Plenty of logs like the portion of our stock shown above have made possible the million and a half foot stock of well manufactured American Walnut Lumber which we now have to offer.

Prompt shipment

All grades and thicknesses

Guaranteed Inspection

12th AND BELT LINE

Kansas City - Kansas

— *A name worth remembering* —

Thomas E. Powe Lumber Co.

St. Louis, Mo.

Manufacturers and Wholesalers of

SOUTHERN HARDWOODS

Specializing in

Ash-Oak-Gum-Poplar

Mills: PRESCOTT, ARK.—DOTHAN, ALA.

ST. LOUIS YARD

Mixed Carload Shipments — Carry stocks of the following:

Hickory	Magnolia	Elm
Maple	Willow	Sycamore
Tupelo	Red Cedar	Beech
Cypress	Plain Oak	Quartered Oak
Sap Gum	Red Gum	Mahogany
Poplar	Ash	Black Gum
Yellow Pine		

WAYNE LUMBER CO.

Manufacturers and Wholesalers

110 West 40th St. New York

Canadian Hardwoods

BROWN ASH

10,000' 1¼ No. 1 Com. & B.
10,000' 1¼ No. 2 Common

BASSWOOD

200,000' 1¼ Log Run
1 car 1½ Log Run
1 car 2 Log Run

SOFT ELM

50,000' 1" Log Run
40,000' 2 Log Run

BIRCH

15 cars 1" No. 1 Common
15 " 1 No. 2 Common
10 " 1¼ No. 1 Common
7 " 1¼ No. 2 Common
10 " 2 No. 1 Com&1s&2s
7 " 2 No. 2 Common
3 " 2½ No. 1 Com&1s&2s
3 " 2½ No. 2 Common
4 " 3 No. 1 Com&1s&2s

HARD MAPLE

40,000' 1¼" No. 1 Com&1s&2s
10,000 1¼ No. 2 Common

MAPLE AND BIRCH OUR SPECIALTY

BOXING & CRATING

6 cars 1" Soft Elm & Ash
10 " 1" Birch

All Lumber Shipped by Our Own Inspectors

A name that should be on your inquiry list for Hardwood Lumber

American Column & Lumber Co.

Brunson Building, COLUMBUS, OHIO

—Manufacturers of—

West Virginia

Soft Yellow Poplar
Plain White Oak
Plain Red Oak
Quartered White Oak
White Oak Timbers and Plank

Chestnut	Butternut
Basswood	Ash
Maple	Cherry
Hickory	Walnut
Beech	Sycamore
Buckeye	Black Gum
Birch	Hemlock

Oak and Hardwood Dimension Stock

Steele & Hibbard Lumber Co.

ST. LOUIS, MO.

56 Years in Business

We carry a large stock of dry

Hardwood Lumber

25 Different Kinds
Quick Shipment
Write or wire for Prices

We specialize Oak cut from Mild Texture Missouri Timber with thin sap both plain and quarter sawed.

We ship also from Sawmills direct; Red as well as Sap Gum and Poplar both plain and quarter sawed, Sound Wormy Chestnut, Cypress and Ash.

"Wire collect for prices or other information. Time is Money, delays pay no dividend."

Burns & Knapp Lumber Co.

Manufacturers of

Southern Hardwoods

Plain White and Red Oak, Dimension Oak, Hickory, Ash, Chestnut, Poplar, Basswood, Walnut, Maple, Beech, Butternut.

CONNEAUTVILLE, PA.

We list below, items of our own manufacture, band sawn, that we are in a position to ship promptly.

1/2", 5/8, 3/4, 4/4, 5/4, 6/4 & 8/4 Quartered White Oak

3/4, 4/4, 5/4 & 6/4 Qtd. Red Oak

5/8, 3/4, 4/4, 5/4, 6/4 & 8/4 Plain Oak

4/4, 5/4, 6/4, & 8/4 Sound Wormy Oak

5/8, 4/4, 5/4 & 6/4 Plain Sap Gum

4, 5, 6, 8, 10 & 12/4 Qtd. Sap Gum

4, 5 & 6/4 Plain Red Gum.

4, 5, 6, 8, 10 & 12/4 Qtd. Red Gum

4, 5, 6 & 8/4 Tupelo Gum.

5/8, 4, 5, 10 & 12/4 Ash.

5/8, 4, 5, 6, 8, 10 & 12/4 Elm.

5/8, 10 & 12/4 Maple.

4, 5 & 6/4 Cottonwood.

MAY BROTHERS Office and Band Mills: MEMPHIS, TENNESSEE

High Grade White Hickory

Why Pay High Freights on Waste Material? Stock sawed free and clear of defects to specified sizes. Waste eliminated at source. Operating numerous Mills throughout the choicest HARDWOOD BELTS in the United States.

"Buttcutt" Brand

Hickory, Oak and Ash

DIMENSION STOCK

Ski Billets, Picking Sticks, Hockey Sticks, Coupling Rods, Handle Blanks, Furniture Stock, Dowel Blanks, Rim Strips, Spoke Blanks, Shaft and Pole Stock, Gear Woods, Vehicles and Motor Woods for Bending Purposes.

Brown Brothers Company
MANUFACTURERS
11 Broadway - New York

The BRAND of QUALITY

Bigelow HARDWOOD PRODUCTS

The SYMBOL of SERVICE

A Complete Stock of Assorted Grades and Thicknesses

NORTHERN HARDWOODS

ASH, BEECH, BIRCH, BASSWOOD
SOFT ELM, ROCK ELM, HARD MAPLE

THE BIGELOW-COOPER CO.
BAY CITY - - MICHIGAN

St. Francis Basin Hardwoods

Kraetzer Cured and Air Dried

Tennessee Aromatic Red Cedar

Carloads and less or mixed with Hardwoods

"What Others Say"

"Your letter of February 15th received and we want to say that this was a very nice lot of lumber. It was good widths and lengths and well manufactured, dry stock and the grading was very liberal. We are sorry we cannot use more of this lumber at the present time. *We received several cars from other manufacturers at a cheaper price but the lumber was not nearly as satisfactory.* When we are in need of more stock we will take the matter up with you."

(Note—The above was sent us February 24, 1921 unsolicited. Name given on application).

GEO. C. BROWN & COMPANY

Home Office - MEMPHIS, TENN.

BAND MILLS, PROCTOR, ARK. CROOKED BAYOU, ARK.

The Arrow Lumber Co.

Manufacturers and Wholesalers of

West Virginia Hardwoods and White Pine

Oak Timbers Our Specialty

PARKERSBURG, W. VA.

Mills: Raleigh, W. Va. Natural Well, Va.

McLEAN MAHOGANY & CEDAR CO., INC.

American Hardwoods

WE SOLICIT YOUR ENQUIRIES

742 Ellicott Square, Buffalo, N.Y.

Yellow Poplar Lumber Co.

Manufacturers of Band Sawed

Poplar Plain Oak
Quartered Oak
Chestnut Basswood

Capacity 50,000,000 per annum

SPECIALTY: Monogram Brand Oak Flooring

CANADIAN ENQUIRIES SOLICITED

COAL GROVE, OHIO, U. S. A.

Tennessee Lumber & Coal Company

Manufacturers and Wholesalers

SOUTHERN HARDWOODS

Soft Textured White and Red Oak, Poplar, Chestnut, Southern Gum

OAK TIMBERS AND PLANKING CUT TO ORDER

Band Mills: Verdun, Tenn., Louvain, Tenn. Submit your enquiries to our Sales office, Cincinnati, Ohio.

For Discriminating Buyers

Dry stock ready for prompt shipment

FIGURED RED GUM

3	cars	4/4″	No. 1 Com. & Btr.
2	"	5/4″	No. 1 Common & Better
1	"	8/4″	No. 1 Common & Better

SAP GUM

2	"	4/4″	FAS
2	"	4/4″	FAS, 13″ & up
3	"	4/4″	Box Boards, 13-17″
1	"	5/4″	FAS
1	"	8/4″	Com. & Btr.
3	"	4/4″	No. 1 Common
4	"	5/4″	No. 1 Common
8	"	4/4″	No. 2 Common
10	"	5/4″	No. 2 Common
1	"	6/4″	No. 2 Common
1	"	8/4″	No. 2 Common

PLAIN RED GUM

1	"	4/4″	FAS
3	"	5/4″	FAS
6	"	4/4″	No. 1 Com. & Btr.
3	"	4/4″	No. 1 Common
5	"	5/4″	No. 1 Common
1	"	8/4″	No. 1 Common
3	"	4/4″	No. 2 Common

QUARTERED RED GUM

3	"	4/4″	Com. & Btr.
2	"	5/4″	FAS
5	"	4/4″	Com. & Btr.
4	"	6/4″	Com & Btr.
3	"	8/4″	Com. & Btr.
3	"	5/4″	No. 1 Common

SOFT ELM

1	"	4/4″	Log Run
1	"	5/4″	Log Run
2	"	6/4″	Log Run
1	"	8/4″	Log Run
2	"	10/4″	Log Run
2	"	12/4″	Log Run

QUARTERED RED GUM S.N.D.

1	"	5/4″	FAS
1	"	3/4″	Com. & Btr.
3	"	4/4″	Com. & Btr.
10	"	6/4″	Com. & Btr.
7	"	8/4″	Com. & Btr.
2	"	5/4″	No. 1 Common
2	"	10/4″	No. 1 Common & Better
2	"	12/4″	No. 1 Common & Better

WILLOW

5	"	4/4″	Log Run

CYPRESS

1	"	4/4″	No. 1 Shop
2	"	4/4″	No. 1 Common
1	"	5/4″	FAS
1	"	5/4″	Select
1	"	5/4″	No. 1 Shop
1	"	8/4″	FAS
1	"	8/4″	Select
1	"	8/4″	No. 1 Shop
1	"	8/4″	No. 1 Common

PLAIN RED OAK

1	"	4/4″	FAS
6	"	4/4″	No. 1 Common
7	"	4/4″	No. 2 & No. 3 Common

QUARTERED RED OAK

1	"	4/4″	FAS
7	"	4/4″	No. 1 Common
6	"	4/4″	No. 2 Common

PLAIN WHITE OAK

1	"	4/4″	FAS
4	"	4/4″	No. 1 Common
2	"	4/4″	No. 2 Common

QUARTERED WHITE OAK

1	"	4/4″	FAS
5	"	4/4″	No. 1 Common
7	"	4/4″	No. 2 Common

WIRE FOR QUOTATIONS AT OUR EXPENSE

The

Frank A. Conkling Company

SOUTHERN HARDWOODS

BAND MILLS:
PERCY, Miss., ISSAQUENA, Miss.

Memphis, Tenn.

Indiana

Quartered Red and White

OAK

1,000,000 feet of dry stock carried at all times

ALSO PLAIN OAK AND ASH

We manufacture all stock carried

Evansville Band Mill Co.

FRANK M. CUTSINGER, Pres.
GEO. H. FOOTE, Vice-Pres. & Treas.
JOSEPH WALTMAN, Secretary

Mills at EVANSVILLE, Indiana

Upham & Walsh Inc.

Throop St. South of 22nd St.

Chicago

Northern and Southern Hardwoods

We make a Specialty of

Oak, Gum, Elm, Maple Birch and Basswood.

We solicit your inquiries regarding lumber of any kind

American Hardwood Lumber Co.

St. Louis, Mo.

Large stock of—

Dry Ash, Quartered Oak Plain Oak and Gum

Shipments from — NASHVILLE, Tenn., NEW ORLEANS, La., and BENTON, Ark.

The Hyde Lumber Co.

Band Mills: LAKE PROVIDENCE LA.
Southern Office: MEMPHIS, TENN.
Bank of Commerce Bldg.
Northern Office: SOUTH BEND, IND.

MANUFACTURERS

Plain Red Gum
Quartered Red Gum
Plain Sap Gum
Quartered Sap Gum
Cottonwood, Cypress
Tupelo, Ash, Elm, Oak

CHARLES O. MAUS
Canadian Representative

WARREN ROSS LUMBER CO.

JAMESTOWN, N. Y.

30,000′	4/4″	1s&2s Tanguile Mahogany	12,000′	8/4″	No. 1 Com. Walnut
35,000′	6/4″	to 16/4 1s&2s Tanguile Mahogany	7,000′	8/4″	No. 2 Com. Walnut
20,000′	4/4″	1s&2s Cherry	15,000′	4/4″	1s&2s pl Red Oak
12,000′	4/4″	No. 1 Com. Cherry	4,000′	5/4″	1s&2s Pl. Red Oak
5,000′	6/4″	1s&2s Cherry	4,000′	6/4″	1s&2s Pl. Red Oak
5,000′	8/4″	1s&2s Cherry	20,000′	8/4″	1s&2s Pl. Red Oak
5,000′	5/4″	No. 1 Com. Cherry	20,000′	4/4″	No. 1 C P Red Oak
2,000′	8/4″	No. 1 Com. Cherry	4,000′	5/4″	No. 1 C P Red Oak
110,000′	1″ to 2″	No. 2 Com. & Btr. Beech	4,000′	6/4″	No. 1 C P Red Oak
1,500′	5/4″	Selects Walnut	10,000′	8/4″	No. 1 C P Red Oak
15,000′	8/4″	1s&2s Walnut	15,000′	4″4″	1s&2s Poplar SND
			3,000′	5/4″	1s&2s Poplar SND
			3,000′	8/4″	1s&2s Poplar SND

Above stock in our Jamestown yard where we have a large stock of all kinds of dry Hardwoods. Also Northern and Southern Hardwoods and Mahogany direct from mill in unlimited quantities.

"Hartzell's Choice Walnut"

The way Walnut comes to us

COMING AND GOING

One constant stream of American Black Walnut from "Stump to Consumer" flowing through a steady, reliable and satisfactory channel.

"Geo. W. Hartzell"

Logs in the rough coming in Veneers and Lumber of the highest quality going out daily year in and year out covering a period of 35 years.

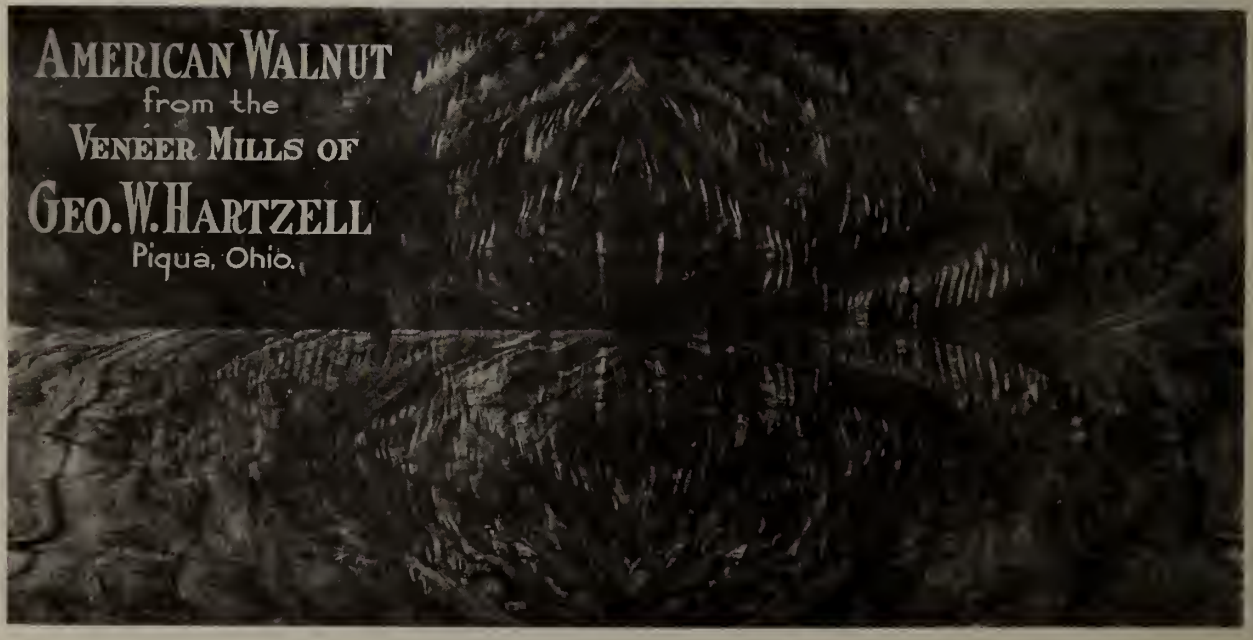
We rightfully claim your patronage because of "SERVICE and QUALITY," if there is any question in your mind about it

"Try Us and We Will Ship You the Convincer"

No Order too large, no Order too small to receive the close and careful attention it is our custom to give. That is a great part of our business, serving our customers.

"WRITE FOR SAMPLES AND QUOTATIONS"

Geo. W. Hartzell - Piqua, Ohio



The way it goes to our Customers

MAHOGANY, WALNUT

LUMBER and VENEER

Poplar Veneer

Quartered Oak Veneer

Loading Mexican Mahogany Logs in the Tropics.

DROP US A LINE WHEN NEXT IN THE MARKET

Lewis Thompson & Co., Inc. - **Colonial Trust Building, Philadelphia, Penn.**

Warerooms: Astoria, L.I., High Point, N.C. Yards: Astoria, L.I., New Orleans, La.; Philadelphia, Pa.

E. R. Spotswood & Son

INCORPORATED

MANUFACTURERS OF

Kentucky Hardwood Lumber

We specialize in soft texture Kentucky Oak—Plain and Quarter Sawed, also in Ash, Basswood, Chestnut, Poplar, Beech.

Let us quote you on your requirements—our prices are right and we can make prompt shipments direct from our mills.

LEXINGTON - - KENTUCKY

Service LHC *Quality*

OUR EXPORT BRAND

Prompt *Shipments*

GUM
ASH
OAK
POPLAR
CHESTNUT

LIVERPOOL HARDWOOD COMPANY Inc.

50 Church St. NEW YORK CITY

Bank of Commerce Bldg. MEMPHIS, TENN.

Highest Quality

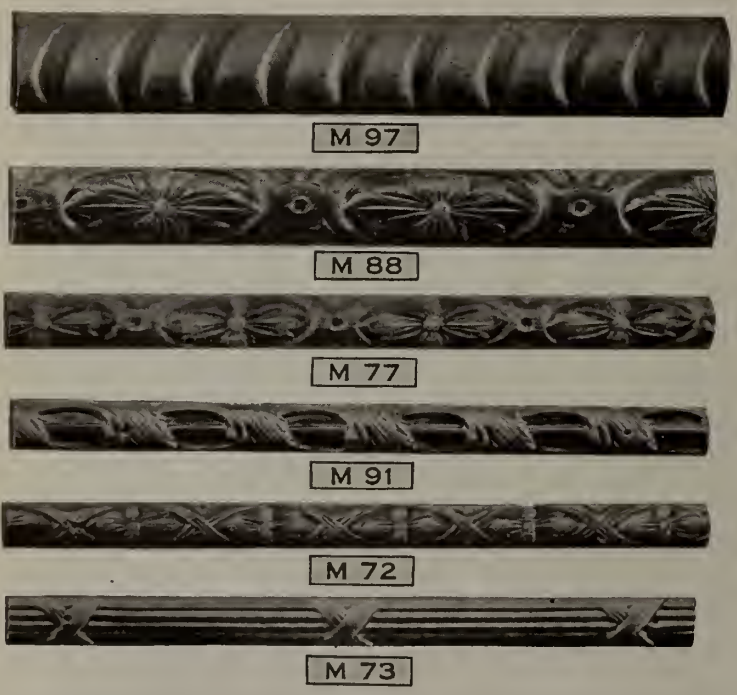
St. Francis Basin Hardwoods

Band Sawmill - Marmaduke, Ark.

OAK
GUM
CYPRESS
TUPELO
SOFT MAPLE

The Vail Cooperage Co.

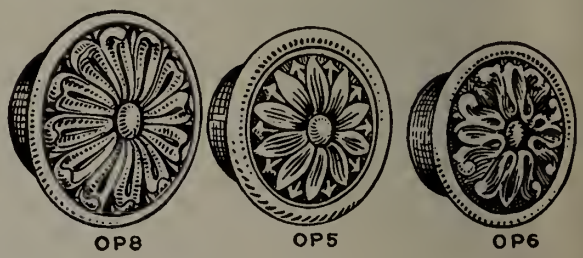
General Office - FORT WAYNE, Ind.



MOULDINGS We are making more Period Mouldings than ever before. Orders should be placed early to assure your supply when needed.

KNOBS The Period Knobs we placed on the market a few months ago are proving very popular. If you have not received samples ask for them now.

ROSETTES A new Period item to accompany the knobs.



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Waste—and Its Prevention

Waste is all too prevalent in the woodworking industry—waste of material, waste of time, of effort, of energy and of power. This constitutes a direct tax on all woodworkers and is reflected in manufacturing costs, resulting in a higher level of prices and affecting the demand for wood products. One is forced to the conclusion that in an effort to lower costs and prices, the elimination of waste is not given the attention its importance warrants.

Increased production per man, per machine or plant has been suggested as one of the panaceas which will result in lower costs and lower prices. There is little doubt as to the efficacy of this suggestion but the difficulty is that, at present, the demand is not equal to normal production, so that any attempt to boost the output will result in an accumulation of manufactured stock. This should not be taken to mean that efficiency is not as important to-day as it was yesterday or last year, for efficiency and economical operation is required now, as never before, even though it is found necessary to curtail production in conformity with general conditions. Because a plant is operating with a reduced staff and on part time is not any reason why every effort should not be made to eliminate all losses and keep manufacturing costs as low as possible.

Waste tends to maintain production costs at a high level, in normal as well as in abnormal times. If waste could be partially prevented or eliminated entirely it would have a marked effect on prices. A large percentage of the losses occurring in woodworking plants is preventable and can be done away with. This may be accomplished by educating the workmen, reorganizing manufacturing methods, putting power plant and equipment in a high state of efficiency, re-arranging the machinery and, if the saving involved warrants the expenditure, installing new production equipment and labor-saving devices.

Probably the most glaring loss occurs in converting the basic raw material—lumber, into the finished product. It has been estimated that the material loss in box factories averages from 17% to 25%; in the planing mill group from 25% to 35%; in furniture factories from 35% to 50% and in some special lines or on certain forms of special work the loss may run as high as 75%. These percentages, which are borne out by cost figures, are startling and strongly emphasize the need of making a greater effort to reduce the material waste.

Let us pause for a moment and consider how some of this loss occurs—time and space does not permit a detailed study of manufacturing operations but a few suggestions may start a train of thought that will lead to good results. In many instances some of it is accounted for by the fact that the grade of lumber used is not suitable for the work in hand, while another part of the loss is due to careless and improper handling. In unloading the stock from the cars, many pieces are broken, split and bruised, entailing a loss or waste. In piling, the different lengths are not kept separate, stickers not placed directly above each other and the piles are not protected from the weather. The result is warped, twisted and checked lumber. In the kiln, the drying operation is not given the attention it should receive, and as a consequence, the drying loss is heavy. Nobody will deny that such losses are preventable and the remedies are obvious. By following the work through each operation, one will be surprised at the number of times material waste can be reduced through the exercise of a little care and ingenuity.

Considerable prominence has been given recently to an organization known as "The Noble Order of Gloom Chasers." Undoubtedly we should be as cheerful and optimistic as we can. Another similar organization, equally important, that should be flourishing, might be called "The National Order of Waste Eliminaters." Each woodworking plant should have its section with every employee and official a member. Every person actively engaged in the woodworking industry should be so imbued with the idea of waste elimination that it becomes second nature to leave no stone unturned in an effort to reduce all avoidable loss. Eliminating waste and reducing costs to a minimum is a man's job and is worthy of the best efforts of the biggest men in the organization. A move in this direction will not be an unqualified success unless the co-operation of every employee is secured.

Elsewhere in this number will be found several interesting articles dealing with electric power, with special references to the problems peculiar to woodworking. This is a timely subject. Articles dealing with other phases of electric drive are scheduled to appear in coming issues.

Innovation in the Construction of Furniture

Providing Outlets for Attaching Electric Appliances Should Appeal to Purchaser —Suggestion Applicable to Many Pieces—Lightens Work of Housewife and Adds to Attractiveness of Home

[The accompanying article by a writer in "Electrical Merchandising" opens up a new line of thought and presents a practically untried field for development by the progressive furniture manufacturer. Would the suggestions offered, if worked out to a successful application, tend to increase the desirability and saleability of the pieces so wired? In attempting to apply these ideas, safety, calling for thorough insulation should be the first consideration. In all probability special outlets perhaps colored and grained to match the different woods, would have to be designed.—The Editor.]

Some day—by the time, perhaps, that every home in the land is a model "home electric"—we shall look back upon our ideas of to-day and realize that a mere skeleton or framework of the things that were to be, was even the most ambitious "home electric" of 1921. Nothing could be more complete, we think now, than the electric services presented in one of these homes. Electric kitchen and laundry equipment, electric dining room conveniences, and enough outlets to make possible the use of all the other household appliances —what more could the housewife ask to make her tasks easy and her home comfortable? For one thing —"electrified" furniture. And do you know what will bring this about? Nothing more nor less important than the need and convenience of the housewife herself!

Sooner or later she will insist on having the dressing table wired, for example—permanently wired—with outlets in it to receive such dressing table acces-

Wired table, doing away with unsightly wires from overhead fixture or mass of wiring beneath table.

sories as the electric hair weaver, hair drier and vibrator. If you've ever had to crawl under the dressing table or bend down half a dozen times a day to connect and disconnect these appliances—and the fan and vacuum cleaner besides—with the wall baseboard receptacles, you'd know how those two little outlets in the dressing table, right at her elbow, would appeal to a woman.

The dressing table, also, needs receptacles for those important items dear to the feminine heart, the electric curling iron and violet ray set. More than that, dressing tables are already being produced by furniture manufacturers having dainty lamps built on either side of the mirror, at the right angle to color softly milady's face while dressing, and of a design and quality in harmony with the result of the dressing table. Seeing women exclaim over this charming addition to a dressing table the wonder is only that more manufacturers have not followed the same example.

If for no other reason than to eliminate the need of bending so often, electric outlets in furniture would be justified, from the woman's point of view. In fact, that is the self-same reason that is dictating so many other changes in modern household equipment and furnishings. Why are kitchen sinks and drain boards being made higher now than formerly? Simply that the housewife need not bend while at work. For the same reason, cooking ranges are being built higher with ovens on a level with the elbows; the ironing board is built on an adjustable framework, so the housewife can raise it to the height most comfortable for her; with the new dustpan, she does not have to bend to sweep up the last pile of dust, and even the sanitary kitchen refuse can is made so that a touch of the foot on a spring causes the cover to open.

Count the number of times a day a woman would have to bend to connect her various electrical appliances to out-of-the-way outlets and you will appreciate the need for wired furniture. Even when the outlet is waist high a change of tenants or ownership frequently means that a piano, bed or china closet must come directly in front of the outlet, although such need not always be the case.

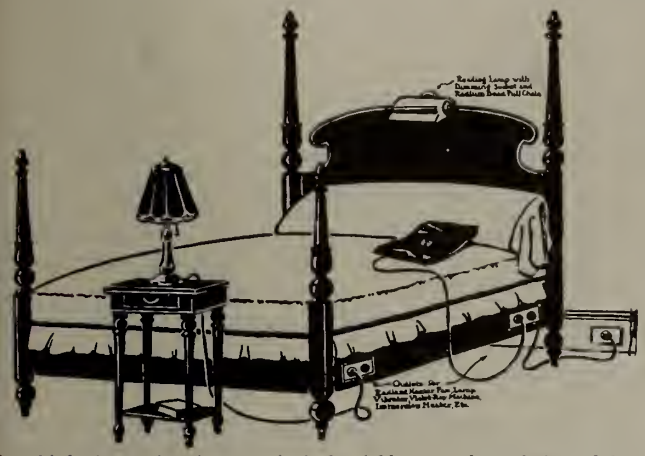
Wired Table vs. Dangling Cord Decorations

Yes, the electrical home of the future undoubtedly will have wired furniture, and one of the first pieces to go into it will be the wired dining room table. Knowing the daily pre-breakfast rites of many families in the ceremony of connecting the percolator to the lamp socket above the table and the toaster and waffle iron to the floor outlet, if not to another lamp socket, the wonder is not that there has been some grumbling but that those appliances continue to be used day after day despite the difficulties of connection! Surely a wholesale tribute to the value of electric table service!

The wired dining room table, of course, is nothing new, but once women generally know of its possibilities, they will look as keenly for it as they now look for the percolating element in coffee pots, or for laundry chutes in the prospective homes which they are inspecting. Now, the hostess has many anxious moments wondering whether her guests' feet are getting tangled in all the appliances and lamp cords under the table. With a wired table having simply three little outlets right under her hand, on the

wooden rim under the table's edge, she has easy control of all the table appliances at her finger's ends. With this arrangement, there need be no hole cut in the table top or in the housewife's treasured table linen and no dangling cords under the table. Also, the problem of connecting electric table candelabra is solved.

Then, there is the wired bed. Frequently the only place for the bed in a room is over against the wall



One-third of our time is spent in bed. Add to comfort of these 8 hours by making provision for use of electric appliances.

outlet. If one wants to use the heating pad in bed, he pushes the bed aside, or else connects the pad a dangerous length across the room to the lamp socket —or else, as more commonly happens, cannot use it at all in bed. Beds can be wired, however, to connect with that elusive baseboard outlet, the bed itself having two or more outlets in the side, so that merely by reaching down while in bed one can connect the heating pad. Also, a wired bed means the luxury of being able to turn on and off, while in bed, the electric fan in the window on hot summer nights, or to light the reading lamp, or to illuminate the clock dial, or, on cold winter mornings, turn on the radiant heater near the bed. Some furniture manufacturers have already produced beds with reading lamps or brackets built into the headboards, so that just by reaching up one can switch on or off the light for reading.

From Tea Wagon to Medicine Closet

The list of furniture articles on which electrical equipment would make an instant appeal to the housewife extends all the way from the tea wagon to the medicine chest. Any woman who has tried to use an electric samovar and toaster and perhaps a dainty lamp on her tea wagon knows what it means to have to disconnect all three if she wants to move the wagon a few feet or else have three cords trailing across the room. With the table itself wired and connected to a wall receptacle, her samovar, toaster and lamp are all conveniently plugged right in the tea wagon itself. Just to list a few of the other pieces that the housewife would like to see "electrified" there are:

Serving tables.—Frequently one must crawl under this table, also, to reach a wall receptacle. Wired somewhat on the plan of the dressing table, it should have receptacles for the percolator, samovar, toaster, iron, plate warmer, lamp—or even the vacuum cleaner!

China Closets.—Breakage of glassware and china on dark shelves may be prevented by having the cabinet interior equipped with lamps which automatically light when the door is opened and go out when it closes.

Kitchen Cabinet.—These also may be equipped, like the china closet, with automatic lighting, as well as with a receptacle in the side for the electric egg beater and mixer, polishing machine, dish washer, etc.

Refrigerator.—The refrigerator is often of necessity in a dark corner, and a lamp automatically lights the interior when the door is opened will at least keep one from dipping one's hand into the apple sauce when reaching for the milk bottle.

Davenports and Chairs.—These may be designed to accommodate electric cigar lighters and lamps—one furniture manufacturer is even making a davenport with an entire phonograph built into one arm, operated by attachment to the nearest electric receptacle.

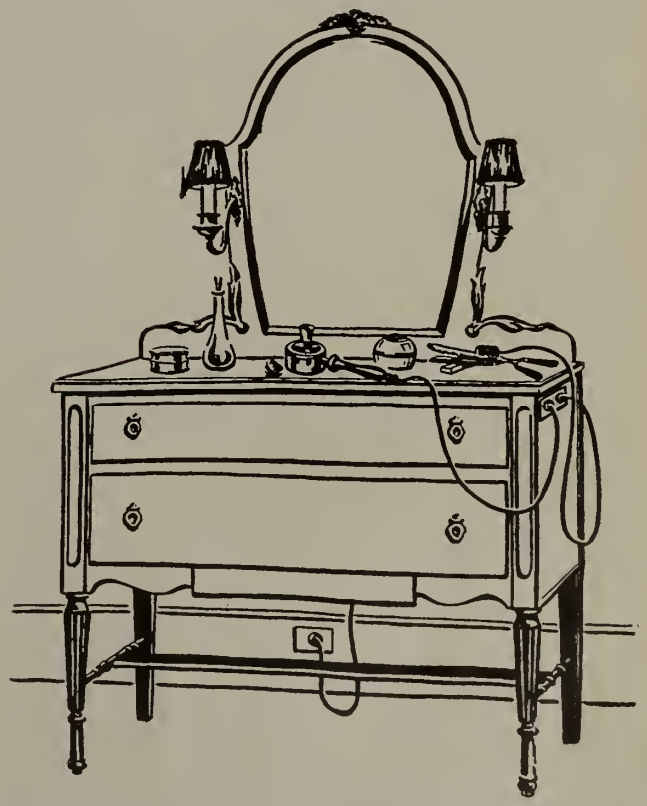
Desk.—Desk lamps, harmonizing in design and quality with the desk itself, may easily be made part of certain types of desks.

Pianos.—We have all seen pianos marred by having inharmonious lamps placed on them in the home. Two lamps built on the front of the instrument and harmonizing with it in design, add to its beauty and at the same time give better light to the music page.

Phonographs.—A small lamp that automatically lights the record when the cover is lifted keeps many a record from being scratched when music is being enjoyed at dusk.

Mirrors.—Small side brackets built on hall mirrors, shaving mirrors, bathroom cabinets, etc., throw far better light on the face than the ceiling light in the center of the room.

Porch Tables.—A porch table wired similarly to the dining room table will add much to the summer



Dressing table with permanent lamp brackets and outlets for electrical equipment.

enjoyment of the electric fan, samovar and reading lamp.

Sewing Machines.—Light concentrated on the sewing machine is welcomed by the woman who has to do sewing at night, and especially when she must thread the needle.

Engineering in Furniture Factories

Consideration of Power Plant and Type of Prime Mover—Economical Utilization of Factory Waste—Comfort and Accommodation of Employees

By B. A. Parks

(Concluded from April issue)

In many plants where breakdown service cannot be obtained from the local public-service company, and in fact oftentimes when such service is available, it will be found economical and convenient to install a small direct-connected high-speed generating unit to furnish lights at night and operate a few machines without its being necesary to operate the main engine. As the exhaust steam from such a unit will generally be all used in the heating system and dry kilns, the power generated is practically a by-product and the only cost for the power generated is the fixed charge incident to the additional investment. Such fixed charges will often be found to be less than the cost of breakdown service from the power company.

With regard to the drive from engine to lineshaft, either belt or rope transmission may be used, although the writer prefers the American system of rope drive to the belt as being somewhat smoother in operation and slightly more efficeint; the total stresses on engine and head-shaft bearings are less, also it requires less careful alignment of engine and lineshafts. The main generator may be either directly connected to the main engine shaft or be driven by belt or rope. The writer prefers the latter arrangement as being cheaper in first cost, allowing of operation of the plant in case of break down to generator, and also of changing the generator for a larger one should it be found that the electric load is going to increase beyond the capacity of the original generator.

Deciding on Boiler Capacity

In choosing boilers for the plant the capacity required may be determined from the total steam demand, adding an allowance of 10 to 15 per cent for pumps and other incidental uses throughout the plant. By dividing the total maximum boiler capacity required into at least three units it will always be possible to operate the plant on two boilers, for even with a maximum demand for steam two boilers will carry the plant by operating at 150 per cent of rating. It is decidedly poor economy to provide just enough boiler capacity to carry the maximum load, for this makes it necessary to do all cleaning and make repairs on Sundays. This means that such work will seldom be done as thoroughly as it should and it is bad for the morale of the power-plant crew for them to feel that they have got to spend nearly every Sunday of the year cleaning boilers or doing other necessary work on boilers when out of service. An even greater argument in favor of providing sufficient boiler capacity so that one boiler may always be out of service is in the interest of continuity of operation, for the failure of one boiler due to accident or other cause is very likely to cause a plant shutdown or even curtail production.

As regards the type of boiler to select, there is no difference in efficiency between a well-set horizontal return tubular boiler and a water-tube boiler. The choice is more dependent upon the capacity required. For any plant requiring a maximum of 500 to 600 b.hp. the writer would prefer the horizontal return tubular as being generally easier to care for and less likely to have accidents than the water-tube boiler. Plants of greater capacity than the above should generally consider the water tube as being preferable on account of space requirements.

Locating Power Plant

The pressure to be carried depends on the type of prime mover and as to whether the prime mover is to operate condensing or non-condensing. In non-condensing plants 100 to 125 lb. gauge pressure should be about the maximum, although the addition of 50 to 75 deg. of superheat will be found beneficial to economies of engines and pumps.

The location and arrangement of the power plant are important as regards the economical transmission of power to the factory and the allowance for increase in capacity. Where lineshaft drive is used the power plant is located in a separate building, preferably near the center of the main lineshaft, though of course within easy distance from engine shaft to main receiving shaft. This location of power plant is also fairly near the centre of distribution for steam and electric current. By arranging the boiler and engine rooms "back to back," that is, with centre line of boilers parallel with centre line of engine and with back of boilers toward the rear end of engine, and with the chimney at one end of boiler room, provision is made for extensions to the power plant without any disturbance of the original equipment. Whether the additional power units shall be arranged to deliver power by belt or electricity depends of course on where the additional power will be used.

Utilizing Factory Waste

The utilization of the factory waste or refuse so as to obtain the maximum fuel value is another problem which should receive its fair share of thought and study. Of course, shavings and sawdust from the various machines will be handled by an exhaust system to a separator on the boiler-house roof and then spouted to the boilers or shavings vault. In most plants the cuttings and culls are collected in push carts by a crew of men and wheeled to the boiler house where they are fed to the furnaces by hand. The above method of handling this part of the refuse is not only expensive from the standpoint of handling cost, but the full value of the refuse as fuel is not realized due to the manner of firing. The installation of a few small "hogs" or chippers, at convenient points in the plant where cuttings collect, discharging into the regular exhaust system will in many cases be found to be a paying investment. The power consumption is considerable and a certain amount of maintenance is required, but these disadvantages will frequently be found to be outweighed by the decreased labor cost and the increased efficiency obtained in burning the fuel. Tests have shown that cuttings run through a hog and spouted to the furnaces in the regular way are worth 25 to 30 per cent more as fuel than when

fed as cuttings into the furnace by hand. This question of the installation of hogs is an individual problem for each plant and can only be intelligently decided by considering all the factors entering into each case.

Another improvement in the handling of refuse is in regard to feeding the excess shavings and sawdust which ordinarily are allowed to collect during the day in a so-called shavings vault. In most plants the contents of the shavings vaults must be fed to the furnaces with a shovel, which is not only laborious but prevents the full fuel value being realized. In the design of a power plant for a woodworking factory for which the writer was partly responsible, overhead bins were installed instead of the customary shavings vault. These bins fed by gravity to a short length of screw conveyor discharging into the furnace fronts, a separate conveyor being provided for each boiler. The speed of these conveyors could be varied by means of a friction drive, thus allowing the quantity of shavings and sawdust fed to the furnace to be regulated in accordance with the load on the boiler. The tendency of the shavings and sawdust to arch over and thus stop feeding was overcome by a simple installation of "fingers" on a shaft leading through the lower part of the bin arranged to be tripped periodically by an eccentric and connecting rod actuated from the conveyor drive shaft. A small blower was also installed with a branch duct arranged to discharge a current of air just below each outlet into the furnace from the screw conveyor and thus blow the shavings and sawdust into the furnace in the same manner as they are spouted from the separator. With a fairly constant boiler load the above installation is entirely automatic and it is no longer necessary to burn coal to augment the refuse fuel which at night was previously necessary.

Conserving Steam and Fuel

Almost, if not quite, as essential to the successful and economical operation of the power plant as the proper selection of the boilers and engines, is the careful consideration given to the auxiliaries such as pumps, feedwater heater, etc. Also the piping layout should be thoughtfully designed, keeping in mind continuity of service and convenient control of all equipment in the plant. Another feature which is not usually found in industrial power plants, particularly the small and medium-sized ones, is a suitable selection of recording gauges and instruments for indicating and recording steam pressure, feedwater temperature, quantity of feedwater, electric power generated, and other data having a bearing on proper cost keeping for the power plant. With the present prices of fuel, oil, and other supplies, it is quite as essential to watch the costs of power production as it is to watch costs in other departments of an industrial institution.

In a woodworking establishment the fire hazard is naturally much greater than in a metal-working plant, consequently more than ordinary care should be exercised in decreasing the fire hazard to a minimum and preventing the spread of fire in case it does start. Buildings should probably not exceed 250 to 300 feet in length without dividing them by suitable fire walls at least 17 inches thick, and extending well above the roof line. Finishing and upholstering departments should if possible be isolated from the rest of the plant by fire walls, and if they are on upper floors and any great distance from stairways, outside fire escapes should be provided. The building codes in many cities require fire escapes on all buildings exceeding certain heights and floor areas.

As already mentioned, all stair wells and elevator shafts should be enclosed in fireproof towers, and to make fire walls and fireproof towers effective all openings should be fitted with automatic fire doors. It is also well to note that all stairs should be of non-combustible material so they cannot be destroyed in case fire is communicated to the stair well itself. All sash should be steel and the windows opposite adjacent buildings, where buildings are 30 ft. apart or less, should be glazed with wire glass. It almost goes without saying that a good sprinkler system should be installed throughout the entire plant with plenty of yard hydrants and a good supply of fire hose. All motor-control switches should be enclosed in steel boxes so arranged that the box cannot be opened when the switch is closed. This precaution is not only in the interest of fire prevention but accident prevention as well. All switches for motors driving spray-booth fans, or for motors in other locations where inflammable gas or dust is prevalent, should be of the remote-control type enclosed in tight steel or iron cases, with a push button near the booth or other machine. Spray-booth fires are a constant source of danger and the method above mentioned of controlling the fan motors is well worth the investment required. Other precautions in either preventing fires or preventing their spreading will apply to certain plants, but the above suggestions will outline the main points to be considered.

Under accommodations for workers may be included the lighting, heating, toilet, and locker-room arrangements of the plant. While some of these features may not be considered as being entirely for the accommodation or comfort of the workers, yet the writer believes they have such a bearing on the morale of the working force that the greatest benefit derived from properly designed equipment as mentioned is through an increased efficiency on the part of the employees. The day of the dark, poorly heated and ventilated factory building with inadequate and unsanitary toilet facilities is past, for the simple reason, if for no other, that any self-respecting man will not work under such conditions; and if the employer with such a factory does obtain a working force he may be sure that he is getting only the flotsam and jetsam of the laboring class and the result will be reflected in both the quantity and quality of his product. Bright, cheerful surroundings, comfortably heated and well ventilated, with adequate sanitary facilities, including a supply of good drinking water, are no longer regarded as an expense by the modern executive but as an investment which pays large returns in increasing production and quality of product, decreasing labor turnover and promoting contentment and loyalty among the employees.

Lighting Important Consideration

The far-too-usual method of providing a drop cord with a bare lamp over each machine or at each workman's bench with a few thrown in for general illumination should not be tolerated in this day and age when good, efficient fixtures may be had at such reasonable cost. While "spotted" fixtures over some machines may be advisable, the writer much prefers good general illumination throughout the entire working space. Where walls and ceilings are painted white with some good industrial enamel, efficient light-

(Continued on page 84)

In Which Class Does Your Plant Belong?

Interesting Figures Gathered From Many Factories--Electric Power Favored in Numerous Plants—Group Drive Most Popular Installation

Electricity as a prime mover for woodworking plants has been receiving a considerable amount of attention during recent years and many are the arguments that have been brought forward for and against the electric drive. Without entering into a technical discussion as to the relative merits or demerits, advantages or disadvantages of the electric motor with

50 H.P. motor direct connected to fast feed planer.

particular reference to the peculiar problems encountered in the woodworking industry, it would appear as if this form of power is being employed on an ever-increasing scale.

In an endeavor to determine to what extent electric motors were being used in the different woodworking plants, the "Canadian Woodworker" sent a questionnaire to a large number of woodworkers in Ontario. About 257 of these responded and some very interesting conclusions may be drawn from the information and figures furnished. Perhaps it would be well to state that this set of questions was not sent to a specially selected list but rather to representative manufacturers selected at random without considering the wealth or size of the firms approached. The number of replies received represents only a small percentage of the number of woodworking concerns in Canada, yet was sufficiently large to permit of some clear-cut deductions being made which should apply with equal force not only to the industry in Ontario but to the whole Canadian woodworking industry as a unit.

Many Plants Fully Equipped

257 plants, from which replies were received, may be divided as follows: Fully motor-driven, 129; steam-driven, 82; partially steam and partially electrically-driven, 46. The combined horse power of the motors installed in these plants totals 10,570, or an average of about 40 h.p. per factory, including both steam and electrically-driven plants. This leaves a considerable field for future development as the power requirements of different woodworking plants would average about 100 h.p. each. 227 reported that power was available in their district, while 11 stated that current would be available at an early date, and 19 stated that they d d not know when it would be procurable in their district. A number of those replying intimated their intention of changing to electricity in the near future.

An objection often made to electric power is that when steam is used the waste and shavings supply the greater part of the fuel required, while with an electric installation the fuel value of this material would be lost, and in addition the disposal of this waste presents a problem of no mean importance. Out of 128 factories, which are fully or partially steam-driven, 108 report that they find it necessary to purchase coal to supplement the waste from the plant. It would appear that power generated from coal at present prices would prove to be costly, to say the least. An electric installation large enough to take care of the excess power requirements over and above that supplied by the fuel gathered around the plant, would seem to be a better proposition than buying coal.

A closer analysis of the information furnished by those plants which are either partially or completely electrically-driven shows that 163 prefer the group drive, while 21 have adopted what is known as the "individual motor installation." Of the latter, some have gone into it on a very large scale, for instance, the Brunswick-Balke Collender Co. with 85 motors, totalling 535 h.p. This is a fine example of a plant completely motor-driven. Some of the other individual installations are as follows:—

20	motors	totalling	200	h.p.
20	"	"	150	"
20	"	"	125	"
9	"	"	145	"
9	"	"	70	"
13	"	"	175	"
44	"	"	135	"
14	"	"	400	"

Reduces Transmission Losses

The squirrel cage A.C. induction motor is the type favored in practically all plants. This seems to be about the best all-round motor for use in the woodworking industry. It is reliable, requires very little attention, will carry an overload for short periods and with its use there is very little danger from fire. One fact brought out was that with either an individual or group installation, transmission losses are reduced in some cases as much as 50 per cent.

The group installation, coupled with ball-bearing transmission, would appear to be about the most efficient form of installation that could be made. While on the face of it the individual drive appears to be ideal, yet often the initial cost is so high that the carrying charges would more than wipe out any savings which might be made. This is one reason why the group drive is favored. This must be taken to apply in a general way, for there are many instances where the individual drive is by far the best.

Best Motor for Woodworking Installations

Outline of Development of Induction A.C. Motor—Specially Adapted for this Industry—Protective Devices which Tend for Greater Safety

By W. O. Taylor*

The nature of the conditions in a woodworking plant, unavoidable on account of the material handled, requires electrical equipment of the simplest possible construction, and with the least possible degree of fire hazard. This prime reason and the fact that the very large majority of our power distribution systems are alternating current, has made the alternating current motor almost universal as an electrical driving unit in this industry. For this reason only alternating current motors and alternating current equipment is being considered in the following paragraphs:

The induction motor is about the simplest driving unit known, and the fact that it is a constant speed machine and has an even torque, makes it an ideal driving unit for almost any woodworking machine. The nature of the location, with the presence of a certain amount of wood dust in the atmosphere, makes it necessary for the driving unit to be free from moving contacts, liable to cause arcing, and to have a sturdy construction capable of withstanding the accumulation of this wood dust deposit. A squirrel cage induction motor, having modern electrical construction and when of good sturdy mechanical construction, admirably fulfils these requirements.

Development of Induction Motors

A brief history of the development of the squirrel cage winding or rotor construction of induction motors, will no doubt be of interest, as it has advanced especially to the advantage of the woodworking industry. The early design of squirrel cage windings embodied end rings which were soldered to the ends of the rotor bars in all sizes of machines. A subsequent development made use of heavy copper end rings which were bolted to the ends of the bars, the contact being further strengthened by the use of lock washers. This construction was not applied to very small sizes as it was practically impossible to assemble this construction in very small sizes. It was, however, a distinct advance over the use of the soldered construction in the larger sizes, as it is easy to appreciate the disadvantage of the use of solder on account of the fact that under extreme temperature conditions, such as may be caused by very heavy overload, solder is liable to melt and be thrown out causing small arcing in the rotor winding and with great danger of injury to the stator windings, and a considerable fire hazard where inflammable material is in the atmosphere or close by.

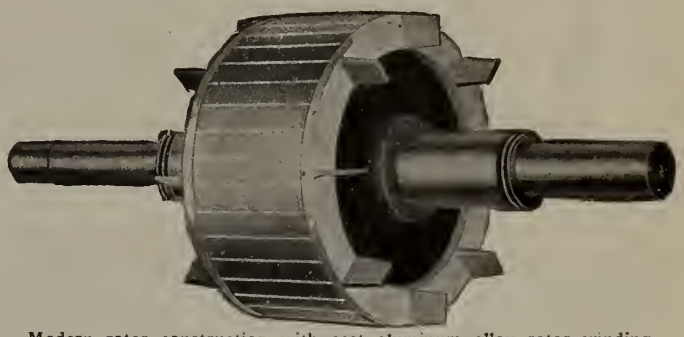
A further advance has been made in the mechanical construction of these motors during the last few years, which has brought this machine to a remarkable degree of simplicity and safety. This consists of the all cast rotor winding, or as it is frequently described, cast aluminum rotor construction. In this construction, the laminations, end supports and shaft of the rotor are first assembled together and by placing in a suitable mould, the rotor bars and rotor end rings are cast in one operation of aluminum alloy. This makes an absolutely solid winding construction, bars and end rings being of one piece. This aluminum alloy is also found to have excellent properties for this service.

*Northern Electric Co., Limited.

Soldered Connections Eliminated

Another excellent rotor construction developed in recent years, is the welded or cast welded construction, in which the copper bars are welded together and end rings formed by two different methods. One method is by using spacers of copper between the individual bars and welding them all together, forming the end ring out of the welded ends of the copper bars and the spacers. Another very satisfactory method is by setting the rotor on end with the ends of the bars in a suitable mould and cast welding a copper end ring to the ends of the rotor bars. The latter welded, or cast welded construction, is generally used in medium and larger sized motors, and by some firms used in all sizes. The all cast windings, or cast aluminum construction, cannot economically be made in the larger sizes, as the quantity of machines built in the larger sizes would make the cost of such machines too high on account of the high cost of the tools necessary to form this construction.

While it has been possible to remove the soldered connections from the rotor construction and provide



Modern rotor construction with cast aluminum alloy rotor winding.

a remarkably sturdy trouble-proof machine, it is impossible to provide stator windings having quite the same degree of simplicity. The design and construction of the coil windings have, however, also been developed to a degree where the amount of trouble is negligible under all reasonable operating conditions. The coils in the medium and larger sized motors are generally form wound; this construction enables the coils to be thoroughly insulated and baked, and made practically a solid piece before placing in the slots of the machine. Some manufacturers have also arranged to make up their coils in groups of the maximum number allowable in the particular rating, which reduces largely the number of joints and connections necessary after the windings are placed in the machine.

Require Reasonable Attention

The form wound construction cannot practically be furnished in very small sizes, and in the small motors where it is necessary to use hand wound coils, care is made to give the utmost protection by dipping and baking the entire frame and windings after connections are made. This brings this construction as nearly as possible on a degree of service, to equal the

form wound coils used in the medium and larger sized machines.

Of particular importance to woodworking plant operators, is the mechanical construction of motors used, and the modern induction motor as built by leading high-class manufacturers, here also gives the maximum degree of service with very little attention and practically no trouble. The bearings are of liberal size and generally designed to be oil and dust tight, and to prevent any oil from getting on to the shaft and into the windings. The bearings are almost always provided with an oil gauge and an outlet, and by giving a little attention periodically to the bearings, a very long satisfactory service will be ensured.

Safety in Starting Devices

Squirrel cage motors of 7½ h.p. capacity and over, are usually provided with an oil immersed starter, generally equipped with a no-voltage release to trip the starter, and cut out the motor when the power goes off. This equipment is furnished by the motor manufacturers complete with the motors of medium and larger sizes.

A most important matter very often overlooked, is the providing of good protective starting equipment for motors of smaller size than those provided with an auto-starter. This refers to motors under 7½ h.p. A very large proportion of trouble which has occurred from time to time with motors under 7½ h.p., has been found due to single phase operation, and the motor afterwards burnt out when really the windings were not defective, and suitable protective devices would have avoided this serious and expensive repair to the motor. The additional cost of an oil starter or small industrial oil switch for controlling these motors under 7½ h.p., is very small when compared with the protection they provide. Having the contacts under oil, the danger of poor contact caused by blistering on a knife switch is removed, and the starting device provided gives added confidence to the operator handling the machine, and protects these small motors on a similar basis to the protection provided by the auto-starters furnished with the sizes from 7½ h.p. up.

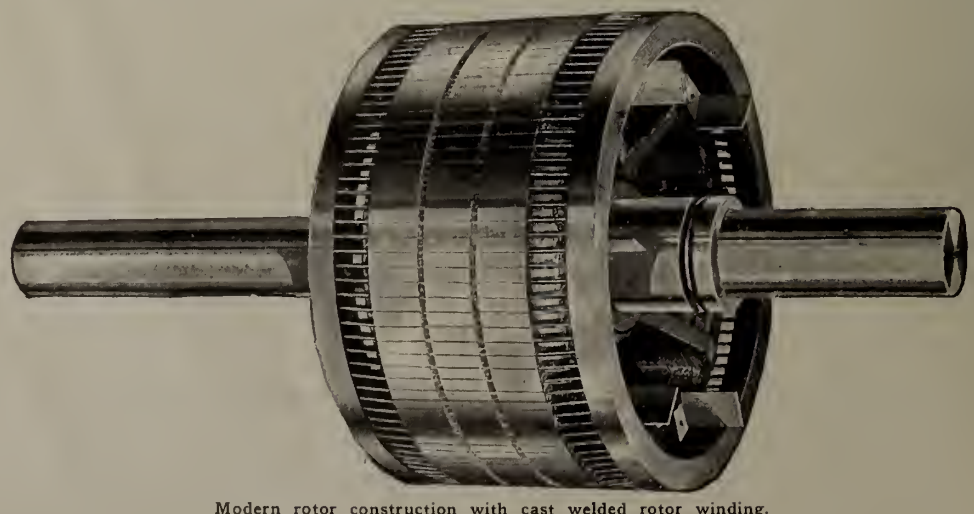
When you feel that you want to tell the foreman that he is no gentleman, resolve that when you reach home you smile at your wife.

Home Furnishings Bureau Organized

The Home Furnishings Bureau, which was recently incorporated as separate and distinct from the Furniture Manufacturers' Association, has been organized on a working basis. The following officials have been elected: W. J. Anderson, chairman; J. H. Baetz, secretary; G. W. Gibbard, J. H. Kennedy, D. E. Macintyre, A. H. Smyth and H. M. Snyder, directors. T. Lyle Blogg will direct the work as heretofore.

An effort is being made to secure the support and co-operation of all furniture manufacturers, and it is hoped that an extended publicity and sales compelling campaign will be inaugurated in the near future. Already more than half of those who supported the publicity work last fall have promised their support, and it is hoped that before long sufficient funds will be available to enable active work to be undertaken.

Many of the furniture manufacturers feel that had it not been for the publicity campaign which was carried on for a few months last fall, conditions in the furniture industry would be much worse than they are today. The general public have only so much money to spend and it is felt that the furniture industry must take the aggressive in order to secure their share. The manufacturers of automobiles, washing machines and vacuum cleaners are all on the alert, and unless the furniture industry awakens to the seriousness of the situation, they will find that these other industries are encroaching on their business and getting money which should go toward furnishing the home. In manufacturing and selling furniture, the furniture men are dealing with a commodity which goes into and makes the home and which must be lived with, and it should not be hard to convince the public that if they have any money to spend, good furniture and an attractively-furnished home means more in the way of comfort, pleasure, pride and general satisfaction than automobiles, washing machines and similar articles. Again, in view of the fact that the campaign which is to be waged by the American furniture manufacturers will, owing to the way American magazines circulate in Canada, reach the Canadian public and may create a demand for American stock, the Canadian furninture makers should make a determined effort to keep Canadian-made furniture to the fore.



Modern rotor construction with cast welded rotor winding.

What Form of Drive Shall I Adopt?

Points to Consider in Analysing Power Requirement of Plant—Comparison of Individual and Group Drives—Load Motor to Capacity for Best Results

By R. J. Owens*

The application of motor drive to all classes of machinery used in the various industries has undergone a marked development during the last few years, due principally to the scarcity and high cost of labor, and to the demand for increased production. No problem confronting the industrial engineer, the shop manager or the foreman deserves more consideration than that of motor drive. It is the key note of economic transmission of power and production. Extensive tests made in a large number of installations have shown conclusively that without motor drive the transmission losses are abnormal, in the majority of cases approximately 50% of the total power consumed, requiring the use of a larger boiler and engine.

Motor replacing countershaft or shaper, drive being from pulleys on both sides of motor.

Motor drives for any class of machinery may be divided into two classes, namely group drive and individual drive. Each of these methods has its own particular advantages, depending upon the conditions under which the driven machine operates. In a given installation there are many fluctuating factors present which make it impractical to set a fixed rule which will govern the selection of the type of drive most desirable.

Group drive is applicable where the driven machines are small and all run at approximately the same fixed speeds. If only a short line shafting and few belts are required for the group of machines, individual drive would involve a higher first cost which would not be offset by the saving in increased output and economy of operation.

Advantages of Individual Drive

Individual drive is preferable for pumps, blowers, elevators, machine tools and woodworking machinery as it eliminates losses entailed in the use of shafting and pulleys for power transmission and at the same time requires less space and reduces the cost of repairs. Some of the main advantages of individual drive are:

1.—An increased output per machine.

2.—Smaller power house capacity required.

3.—Operating cost minimized.

4.—Increased safety for operators due to absence of belts, pulleys and shafting.

5.—Increased light due to no overhead line shafting in belts, allowing evenly spaced lighting units.

6.—Cleanliness and neatness more easily maintained.

7.—More floor space available.

8.—Permits machines to be placed to best advantage both as regards flow of materials and lighting facilities.

Before a selection of equipment is made for the installation of motor drive in an industrial plant, a complete analysis of the surrounding conditions is necessary for the determination of the motor capacity and the type of control apparatus best adapted to any particular case. In order to insure reliability and continuous service of the installation, careful consideration should be given the combination of the motor, control apparatus and driven machine. The characteristics of each of these three elements should be studied with the end in view of obtaining the most satisfactory drive under all possible operating conditions.

Some Points to Consider

It is necessary to have sufficient data from which to determine such operating conditions as will influence the choice of the driving and controlling apparatus. In addition to the size and type of motor, the relative values of each of the methods of drive are to be considered. The size of the motor will depend upon the maximum load on driven machines, its duration, and the temperature rise allowable in the motor under actual full load operation conditions. The following items should be known in as much detail as possible, all of which will have a more or less direct bearing on the choice of the motor and control equipment as well as the method of drive which will be the most economical:

Band resaw direct driven, using flexible coupling.

1.—Kind of current available; whether alternating or direct current.

2.—Source of power; whether supplied from an

*Mechanical Appliance Co., Milwaukee, Wis.

isolated plant or from a central station system.

3.—Voltage; and if alternating current, phase and frequency.

4.—The nature of other loads on the same power line to determine the effect of starting motors.

5.—Description of driven machine. Under this item may be included the conditions under which the driven machine operates; whether the load is continuous or intermittent and if constant or variable speed is required.

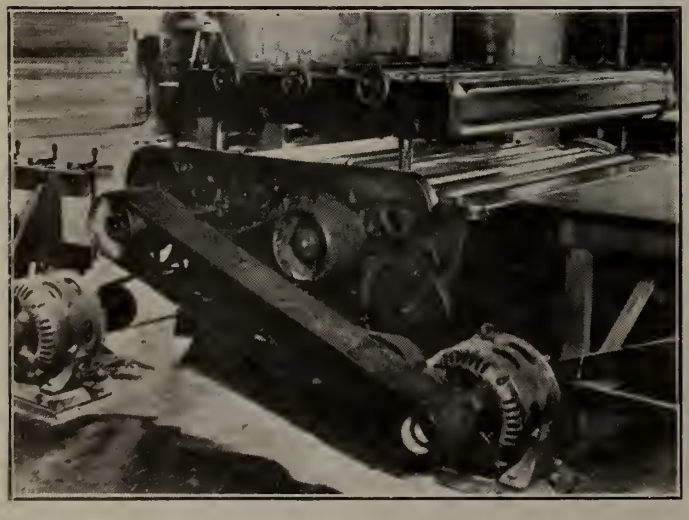
6.—Method of driving; group or individual drive, type and size of coupling if direct connected, pulley data is belted, size of pinion if gear or chain drive, also data if friction pulley or clutch drive.

7.—The load conditions are of the utmost importance in determining the motor capacity and the particular type of motor adaptable. The driven machine in all cases has a cycle of operation, either where a definite cycle repeats itself periodically, the motor coming to rest or running idle between cycles, or a variable load with a repetition of cycles. If possible a load diagram should be obtained of a complete cycle of duty showing the maximum horse power, time on, time off, and friction load. The future load conditions should be considered, as well as the possibility of varying the cycle of operation to any advantage and the fly wheel effect of the moving parts of the machine.

8.—Conditions of starting; intervals at which machine is started and stopped, reversals, time necessary for acceleration and the application of the load during starting.

9.—Speed; what kind of speed regulation is necessary; is standard adjustable speed required. What speed range is required. Also the relation of the load to the speed, that is, does the load increase with the speed, or is the load constant regardless of speed, or any other possible relation.

10.—Control equipment; desirability of either hand or automatic control, and if automatic is remote control desirable, and the location of the various elements



Sander driven by two motors, belt connected. Eliminates countershaft.

of the control equipment. What kind of protection is wanted, that is with reference to voltage failure, phase reversals or phase failure and overload protection. Additional data should also be included with reference to brakes, limit switches, etc., which may be required.

11.—Location of motor; what are conditions of the location of the motor with reference to dust, acid fumes, moisture, inflammable material, high temperature, ventilation, safety requirements and insurance rules. Also in connection with the location of the motor relative to the driven machine the method of mounting should be considered and also the provision for accessibility which will have a direct bearing on the ease of making repairs to either the motor or the driven machine.

Special Types of Motors

Each type of alternating and direct current motor has a particular field of application depending upon the mechanical design and operating characteristics. The

Direct motor drive to planer head, through flexible coupling.

increasing expansion of transmission lines throughout the country and the development of municipal power plants is making use of alternating current almost universal.

Taking into consideration the types of machines which require motors having adjustable speeds, the alternating current motor has certain limitations as compared with the direct current motor, where self-contained motor drive is desired. In a majority of cases the alternating current motor will give the same results, using the slip ring variable speed type or the multi-speed squirrel cage motor. In the former a speed range from normal to 50% of normal is obtainable, but this type of machine is not suitable for all drives as the speed varies with the load and the controller cannot be set to obtain certain definite speeds unless the load at each speed is known. The latter tpye, the multi-speed motor, has been designed for from two to four speeds, and has essentially the same operating conditions as an adjustable speed D.C. motor, the speed at each point varying only slightly with varying loads. The stator of this motor has a separate winding for each speed, any one of which may be connected to the line, speed changing being accomplished by connecting the proper winding to the line. In a four speed motor this amounts to practically four squirrel cage motors in one. This is a new type of motor and is not very well known, but for various applications it has attractive possibilities.

The squirrel cage type of motor will meet the majority of requirements in the field of alternating current applications. On account of its rugged construction and being little effected by dust, it may be used in many locations where enclosed or semi-enclosed direct current motors would be required. This type of motor may be supplied with enclosing covers for locations where exposed to excessive moisture or abrasive dust, in which case the capacity is decreased, except where very intermittent service is required, and the selection of the motor should be made with this in mind. A considerable saving in first cost, as well as in

the operating cost can be effected by ordering equipment for intermittent duty. This requires a careful study of the load conditions. Efficiency and power factor are of importance where the motor is to operate for long periods, and power is excessive..

Load Motor to Capacity

Most standard motors are so designed that the maximum efficiency occurs at full load. In the selection of a motor for a given load, care should be exercised in using a motor which is not too large, as a standard motor operating at a fractional part of full load has a low power factor and efficiency. In a group of motors the matter of power factor reaches considerable importance, especially where the supply line is of considerable length. A low power factor causes a heavier current to flow, which in turn produces greater line losses and a lower generator capacity. A common fault in a great many applications is the "play safe" tendency in selecting a motor of sufficient size to do the work. In cases where it is impossible to obtain sufficient data relative to the power required to drive a machine, its requirements may be measured by the use of a trial motor before the permanent selection is made.

In many instances in the installation of group drive where one motor is used of the same size as would ordinarily be required to drive each of the machines separately, or large motors had been replaced by smaller ones in individual drive the result has been to produce a higher power factor, better voltage regulation and efficiency. As will be noticed from efficiency and power factor tables of standard motors the higher speed motor has the highest efficiency and power factor. Considering this point and also that the higher speed motor is smaller, lighter, and less expensive for the same horse power, it is obvious that considerable improvement in both economy and quality of service may be made by choosing the higher speed motor, particularly where the driven machines operate at high speed which would necessarily require belting or gearing if low speed motors were used.

Power Rates in Force in Various Sections

Figures Showing Charges Which Prevail in Well Known Centres—Power Costs Very Reasonable—How Does Your Rate Compare?

There is hardly a town of any importance in Canada in which current, either steam or hydraulically generated, is not available for power purposes. The rates in the various sections vary somewhat but in no case can they be called prohibitive. Where the power is generated in coal-burning plants, the price of coal and the high freight rates are factors to be considered in fixing the rates charged. In such provinces as British Columbia, Ontario and certain parts of Quebec where waterpower is available in large quantities, the power rate is comparatively cheap, while in other sections, which are not so favored and

Battery of fast feed matchers with individual drive. Notice absence of heavy drive belts.

which are at a considerable distance from coal fields, it is only natural to expect higher charges.

Nova Scotia

It may be of interest to compare some of the rates which prevail in different parts of Canada. Starting with the Maritime Provinces, we find that in Halifax the charges work out at an average rate of about 3-6/10c net per kw. hours.

In Amherst, N.S., the rate is graduated as follows:

4c per h.p. per month for the first 180 hrs. of connected load
3½c per h.p. per month for the second 180 hrs. of con. load
2¼c per h.p. per month for all over 360 hrs. of connected load

A guaranteed minimum monthly charge of $3.75 is made per h.p. demand. The above figures apply on installations of 60 h.p. and over.

New Brunswick

In St. John, N.B., and vicinity, the charges are fairly high. This is accounted for as outlined above by the fact that the current is steam-generated. The prices charged by the New Brunswick Power Co. at St. John are as follows:

For the first	200	Kw.H. per month	12c	per Kw.H.
" " next	300	" " "	8c	" "
" " "	500	" " "	5½c	" "
" " "	1000	" " "	4½c	" "
" " "	3000	" " "	3½c	" "

For any excess over 5000 Kw.H. per month 2¾c per Kw.H.

These charges are net and are not subject to discount. The lighting rates are on a sliding scale, starting at 15c per Kw.H. and dropping to 7½c per Kw H.

Quebec

In Montreal and Quebec a sliding scale per h.p. applies when on a 5-year contract. The charges vary from $50.00 per h.p. per year for 1 h.p. to $30.00 per h.p. per year for installations of 100 h.p. and over. On a meter basis the rate slides from 3c per Kw.H. for amounts under 200 Kw.H. per month to 1c per Kw.H. for 5,000 Kw.H., and .08c per Kw.H. in excess of 5,000 Kw.H.

Ontario

In Ontario the majority of the municipalities are supplied with power by the Hydro-electric Power Commission of Ontario. The charges in each municipality vary according to the distance from the source of supply and according to the amount of

current used. Two charges are made, one a fixed service charge, which covers the carrying charges on the investment required to supply each municipality with current, covering such items as transmission line, sub power stations and service costs. This is a fixed charge whether current is consumed each month or not. The other charge is based on the amount of current used. The charges which prevail in a few of the principal woodworking centres in Ontario are as follows:

	Service Charge per H.P. per month.	1st 50 hrs. per month, per Kw.H.	2nd 50 hrs. per month, per Kw.H.	All additional current per Kw.H.	Discount
Guelph	$1.00	c1.467	c1	c0.15	10%
Ingersoll	1.00	1.67	1.11	0.133	10% & 10%
Kitchener	1.00	1.86	1.26	0.16	25% & 10%
London	1.00	1.86	1.26	0.16	25% & 10%
Midland	1.00	2.0	1.4	0.15	10%
Ottawa	1.00	1.8	1.2	0.15	15% & 10%
Owen Sound	1.00	2	1.4	0.15	10%
Preston	1.00	1.67	1.11	0.13	10% & 10%
St. Catharines	1.00	1.6	1.06	0.16	25% & 10%
Stratford	1.00	2.5	1.7	0.15	10%
Toronto,	1.25 first				
10 h.p.	1.00 all	1.5		0.5	0.15	10%
additional					
Waterloo	1.00	1.67	1.11	0.13	10% & 10%
Woodstock	1.00	1.86	1.26	0.16	25% & 10%

Manitoba

Working toward the west we find that in Winnipeg, electric power is sold at the rate of 3c per Kw.H. with a monthly minimum payment of 75c per h.p. of total load connected, with a net minimum charge of $1.00 per month per meter. A sliding scale of discounts is in effect in proportion to the amount of the bill. On bills up to $25.00 the discount is 10%; $25.00 to $50.00, 20%; $50.00 to $100.00, 25%; $100.00 to $200.00, 30%; $200.00 to $300.00, 40%; $300.00 to $500,00, 50%.

Saskatchewan

At Regina, Sask., a service charge of 50c per month per h.p., connected load, is made and the power consumption rate is 5c per Kw.H. for the first 20 hours per month, and is gradually reduced 2.5c per Kw.H. when the amount consumed reaches 900 Kw.H. or over. In addition to this, special concessions are made to large power users depending on the amount of power consumed.

Alberta

In Calgary the power rates are lower. The following schedule prevails:

1,000 to 2,000	kw.h.	consumption	per	month	2c	per	kw.h.
2,000 to 5,000	"	"	"	"	1.8c	"	"
5,000 to 12,500	"	"	"	"	1.6c	"	"
12,500 to 25,000	"	"	"	"	1.4c	"	"
Over 25,000	"	"	"	"	1.3c	"	"

The minimum charge up to 20 h.p. is $1.00 per h.p. of demand per month. The connected load is considered as not less than 3 h.p. and 100% of connected load. Up to 50 h.p., $1.00 per h.p. per month, and not less than 80% of connected load; over 50 h.p. $1.00 per h.p. per month, and not less than 40% of connected load.

British Columbia

The British Columbia Electric Railway Co., Limited, of Vancouver, who supply energy to that city and surrounding municipalities, including Victoria, B.C., utilize the waters of several nearby power sites in generating their current. The charges are divided into four classes. First—Small motors up to 5 h.p., for which the rate is 5c per Kw.H. on the first 300 Kw.H. of monthly consumption and 2c per Kw.H. for all power consumed in excess of 300 Kw.H. In this class the minimum charge is $1.00 per month up to and including a 2 h.p. installation, and 50c per h.p. for all over 2 h.p. Second—For installations of from 5 to 25 h.p. the rates in this class are the same as those given above with the exception that the minimum charge is $2.50 per month up to and including 5 h.p. connected load, and 50c for every additional horse power up to 25 h.p. The third class includes installations of 25 h.p. and over. The rate in this class is 2c per Kw.H. with a minimum charge of $12.50 per month up to 25 h.p. and 50c for connected horse power for all additional loads. The fourth class is for large power consumers with an installation of 200 h.p. and above. The rate in this class at a monthly consumption basis is 2c per Kw.H. for the first 65 Kw.H. per active horse power; ¾c for the next 65 Kw.H., and ½c for all in excess of 130 Kw.H. per active h.p. These charges are subject to the following discount:

100 to 200	active	H.P.	net
200 to 300	"	"	5%
300 to 500	"	"	10%
Over 500	"	"	15%

The one exception in the above class is where a 3 year contract is accepted at a flat rate of $1.00 per h.p. of maximum demand, plus ½c per Kw.H. Under this heading the minimum charge is based on the maximum demand or otherwise 50c per connected horse power.

It will be seen that none of these rates are excessive; in fact they are so low as to make an electrical installation an attractive proposition in any locality where power is available. One advantage of the electric drive and a feature that is appreciated by many users of electric energy is that there is never any doubt as to what the power required to drive a plant costs per month or year.

National Association of Accountants to Meet

The preliminary program of the annual convention of the National Association of Cost Accountants which is to be held in Cleveland on September 14, 15 and 16 next, has just been issued. It provides for three days of conferences on practical cost questions, including "Interest as an Element of Cost," "Cost Systems as a Means of Preventing Waste," "Uniform Methods and Standardized Costs," "Executive Use of a Cost System," "Costing in Canada," and a number of similar topics. It is expected that upwards of one thousand cost men will take part in these conferences.

May Undertake Research Work

The University of Toronto is considering the advisability of making a study of kiln-drying methods as applied to Canadian woods, with a view to improving the process of artificial seasoning. A number of furniture manufacturers have been approached on this subject and in their opinion it would be a good move, one that would fill a long-felt want. It is probable that Prof. Gillespie, of the University of Toronto, will lay the matter before the furniture men at their semi-annual meeting which is to be held on May 18th.

What a Cost System Should Do For You

Tends to Ensure Adequate Profits—Shows Leaks and Weak Spots—Points Out Unprofitable Lines—Desirable Check on Manufacturing Activities

By E. W. McCullough*

(This is the first of a series of articles which are being prepared by Fabricated Production Department of the U.S. Chamber of Commerce. The second installment, "Overhead Expenses and How to Distribute Them in Good and Bad Times" will be included in the June issue of the "Canadian Woodworker and Furniture Manufacturer."—The Editor).

Individuals' memories are limited in the number of accurate records which they can retain. Business consists of transpiring events, all of which must be properly attended to. The solution of the problem of securing reliable records of many transactions without depending upon the fallibility of memory has been found through systematic methods for conducting the operations of business. One of the very important matters relating to business operations, and one in which a number of records are involved is cost accounting.

Primarily, a business to exist must make money. This means that something must be disposed of for more than it has cost. Every manufacturer, therefore, is vitally concerned with the two items—cost and profit. The problems presented in labor, materials, production costs, and keen competition have made it necessary for a manufacturer to determine and constantly to know the cost of his product in order that his business may continue to be a profitable one, and earn the margin of profit desired. There is a definite dividing line between profit and loss, and the location of this dividing line can be and should be accurately determined.

Gives Control of Business

Cost accounting is an accurate method for arriving at the cost of producing a complete and saleable commodity and delivering it to the carrier for transportation, reporting in usable records all of the various elements which go to make up these costs. Records of costs are valuable in themselves, yet it is the detailed information which they contain, available for ready reference, which is of utmost value. Accurate information regarding the various elements which go to make up costs, as contained in cost records, automatically eliminates arbitrary, empirical, or guess costs which prevail to a surprising degree among many manufacturers. The cost system, like an X-ray picture, brings to light imperfect internal conditions and suggests correction.

*Manager, Fabricated Production Department, Chamber of Commerce of the United States.

Checks Variations from Standard Practice

Among the many ways in which cost keeping is an aid to production are the following. It brings to light inefficiencies in system by calling to attention the cost of its operation and points out equipment that has become inadequate by showing an excessive cost of product coming therefrom; it points out employees who are below the standard required, and permits of performances being kept within certain limits by watching the accumulation of costs. Increased production depends largely on the intimate knowledge the management has of all elements in their manufacturing operations which can only be supplied through an adequate cost system. It enables them to establish proper control and increase output as warranted by the cost record.

In many plants considerable sums of money are spent to establish a standard practice of operation. From time to time certain variations from the established standard practice occur, affecting costs in an

Another adaptation of electric drive to shaper.

adverse way. Timely cost reports showing what is happening, rather than what has happened, suggest immediate correction of such inefficiencies. It is not sufficient that executives simply know that expenditures are excessive; they should be supplied with information to determine exactly where these excessive expenditures occur and take action. Definite responsibility for expenditures as well as the authority to make the expenditures should be fixed by an adequate system of cost accounting.

Overhead, or burden, consists of expense items which cannot be directly attributed to some particular product. It is composed of indirect labor and material, rent, etc. Overhead being variable, as related to output, and forming a material portion of a plant's expense, it is necessary that control over these accounts be rigidly kept. Control is possible only when accurate knowledge of the amounts entering into each item composing overhead are known. Guessing or estimating amounts of overhead, as well as arbitrary distribution without a sound basis for the allocation is uncertain and leads to unexpected results. Sales price does not affect overhead, but the amount of overhead definitely and absolutely affects sales price.

Promotes Intelligent Competition

A factory manager should have before him detailed cost reports showing the expenditures necessary to produce articles. With this information at hand, he is in a position to note the variables and put into operation the movements necessary for their satisfactory control. In this respect, the cost system is similar to the nerve system of the body, its function being to transmit information regarding conditions in the entire plant to some central individual or body.

No one enters business to fail but the majority who do lose out do so from various causes, but principally because they disregard the question of costs. Your worst competition is largely from those who do not know what it costs them to produce and do business. When normal production returns, competition will force closer margins and costs must then be known. Why not now?

The manufacturer who bases the sales price of his product on competition without regard to real cost, stands to sell his product at a closer margin than he desires and possibly at a loss. Whether the margin of the profit is ample or not the existing conditions are not known until the date when damage done is beyond repair.

Determines Unprofitable Lines

It is generally conceded that unprofitable lines should be discontinued. Where a variety of articles are manufactured in a single plant a cost system offers the only opportunity for determining positively those lines which are not profitable. Where a single article is manufactured, timely information regarding costs can forestall a calamity.

The raw and semi-finished materials and finished stock are an important part of the assets of a company. Officials who do not properly account for them with respect to price, quality, and quantity, may arrive at a cost lower than is real. This means that profits will be shown as greater than they are. It is obvious that if dividends are paid on the basis of such profits, the capital of the company will be depleted.

A practical, usable cost system should not be complex, but lean toward simplicity. Neither should it require an investment out of proportion to the benefits to be acquired. It should be considered a piece of necessary equipment and treated accordingly; it will return its proportion of dividends on the money paid for it. The adoption of a cost system by a number in any industry, made uniform as to fundamentals, will be found of the greatest benefit in promoting more intelligent trade practices. Technical accuracy in costs, especially in lines involving minute operations, is not altogether desirable or necessary, but costs commercially accurate can always be obtained.

Cost systems, both as to manufacturing and selling, should tie in with the general accounting records so that financial statements drawn will reflect all conditions of the business accurately.

In the making of a budget, the greatest possible accuracy is desirable, and here, too the cost records of the past years afford dependable information.

When a business operates without a cost system, it is in the same position as a boat without a rudder, tossed about by the winds and directed by sources outside of those supposed to be in control, and driven towards an end which is not definite and perhaps not the one desired.

As we catch up in production a new era of competition will ensue, and war time margins will disappear. In their place will come percentages of profit earned by efficiency and determined by accurate cost reckoning.

Produce or Reduce?

In discussing present conditions and suggesting how business might be improved the manager of one woodworking plant puts it squarely up to his men, as follows:

Woodworking products are to-day being sold at prices varying anywhere from 25 to 50% below the prevailing prices of six months ago, and even at this reduction, there is only a small demand as compared with last year. What are we to infer from this condition? First, our finished product consists of labor and material, divided into almost equal proportions. The cost of material has been somewhat reduced—not, however, to the extent to which we have been compelled to cut our prices, whilst labor remains at its former high level.

Trade magazines and other publications have freely discussed the situation and suggested ways and means to reduce cost. Some writers advise greater production. Others, a substantial drop in wages. We cannot procure more for our goods and certainly cannot continue as at present, because, we are going behind every day. It is quite obvious that we must produce more or else submit to a cut in wages.

Do we do the same amount of work to-day as we used to do eight years ago? I say without the slightest hesitation that we do not, and further, we are falling short full 25% of our former standard, which means, that it now takes us five weeks to do what we once did in four weeks. If we can remedy this waste, then the problem will, to a large extent, be rectified. If, however, we cannot or will not do so, the only remaining alternative is by way of the pay envelope. Which shall it be—Produce or Reduce?

There is another way in which we can cut cost, that is by very carefully handling all material, taking great care to get the most out of everything that passes through our hands, and so reduce waste to a minimum. Were this to be done it would have a very marked effect on costs and perhaps on the volume of business secured.

Problems in Standardizing of Dimension Stock

Value of Standardized Dimension Stock Not Recognized—Desirable Economies Could be Effected—600,000,000 ft. Wasted Annually by One Industry

By Wm. A. Babbitt*

The title of this series of studies correctly describes the purpose for which they have been written. Probably no one (certainly not the writer) who knows anything about the complexities and difficulties of the programme of standardization would assume to have the complete answer, or even to be able to state correctly all the problems. It is to be hoped, however, that these studies will serve to stimulate the rapidly growing interest in the standardization programme, and to call forth suggestions and constructive criticisms from all concerned.

In order that lumbermen and wood users, who have not had the opportunity to follow the development of the standardization programme thus far, may get in touch with the situation; a little history might be worth while. The beginnings of the programme are to be found in the efforts of one of the affiliated associations of the Association of Wood Using Industries to establish a sound and dependable basis for standard cost accounting among its member firms. A very exhaustive analysis of the raw material requirements of this association for lumber brought out a number of suggestive facts, and some that were positively startling. The logical and inevitable conclusion from these facts seems to indicate a gradual, but eventually, a complete revolution of procedure, not merely in this particular wood using industry, but in all wood using industries.

Heavy Re-manufacturing Loss

This analysis showed that on a merchantable lumber basis, the association's annual requirements were one billion eight hundred million feet, chiefly hardwoods. This analysis further showed that the logical and only satisfactory basis for the principal raw material factor of cost is not lumber, but dimension stock. An extension of the inquiry shows that this fundamental is also true of nearly all lumber used for fabricating purposes. But when the board measure of this requirement in the form of dimension stock was determined, it was found to be only one billion two hundred thousand feet, board measure. Six hundred million feet are being wasted annually by the reduction of commercial lumber to usable dimension by this one industry alone,—which is one of the smaller at that. Furthermore, it appeared that the bulk of this requirement could have been produced from commercially low grade stock and non-commercial waste, now largely a total loss in lumbering operations. In fact, it has always been known that such a salvage could be made, and that not only the six hundred million feet, but the whole billion eight hundred million feet could be produced from such source.

These considerations naturally raised the final and critical question: "With all these facts established scientifically, and a matter of common knowledge in a general way, both to the producer and consumer of lumber, why should there not be an immediate change to a sound and economical basis?" There is a very large and decisive number of reasons why such a change from a wasteful to an economic basis can be accomplished only by slow stages, against much static and some active opposition. Among these, it may be useful to mention some of the more important.

*Chairman, Committee of Standardization.

Not Easy of Solution

The most difficult feature of the situation is the hugeness of the proposition. It is huge in bulk. Put all the lumber piles on this continent in one huge yard, and it would be a small yard compared to the storage ground required to store the wasted portions of the trees from which the lumber was cut. This matter is not only huge in bulk, it is also huge in its interlocking relations with every phase of manufacture in the country. It is a huge problem presented from the view point of mechanical equipment alone.

The change of basis from the present wasteful methods of wood fabrication to a basis of comparative conservation involves the organization of a manufacturing and sales proposition on the part of lumbermen which eventually will rival their organization for manufacturing and selling merchantable lumber. The problems of dimension sizes and grades are indefinitely more complex and difficult than lumber grades and specifications. The problem of education will be fully as difficult as that, e.g., involved in establishing a market for red gum. The standardization committee is fully aware of these considerations, and cherishes no delusions as to the difficulties ahead, or as to the slow progress that will be made toward their solution.

Under these circumstances, it became evidently both the duty and the opportunity of this association to look for a solution of a condition which produced such enormous wastes, and prevented such huge salvages from the fast waning timber resources of the country. This, briefly, is the story of the beginning of the standardization programme. The organization of the Association of Wood Using Industries and the friendly co-operation of the various associations of lumbermen have now placed this programme on a national basis.

Problems Which Have Been Solved

The first problem has been to get the necessary entente cordiale between the producer and the consumer with regard to the programme of standardization. This has been by no means a simple, easy matter. It required the compilation of much data to establish a presumption in favor of the programme. Dimension stock is no new proposition either to lumbermen or to wood users. Past history has little to testify in its favor. Every lumberman has a choice collection of experience in manufacturing dimension stock, which every wood user can match in his attempts to use said stock. The proof has been fully established that the fault is mutual. The producer did not think that it was worth while to manufacture his dimension properly. He looked down on the job, instead of up to it. The user took the view that because it was dimension stock, and probably manufactured from waste, he ought to be able to buy it at one-half to one-third its real value.

Both parties are now well in accord. Dimension stock is of such high importance that it is entitled to first consideration in care and accuracy of manufacture. Wood users realize that dimension stock, so

manufactured, is the most valuable and economical form in which they can get their raw material: and that to get it, they must pay what it is worth. This means a market price which will make the manufacture of dimension stock a commercially sound proposition for the producer.

The elimination of the "specialty" hazard, in the manufacture of dimension stock, is another problem which has been successfully disposed of. Formerly, both parties to a contract for dimension stock, assumed a risk which does not apply to commercial lumber, viz., the exceptional loss should either party to the contract fail to keep his agreement. If the user failed to take the stock he contracted for, then the producer had left on his hands an unsalable commodity. If the producer failed to deliver, then the user was left with his production crippled or stranded. That this has been no uncommon experience in the past, every party at interest can testify from costly experience.

Standardization Offers Way Out

The answer to this problem is "standardization." By this, we do not mean the standardization of an individual plant, but the standardization of the requirements of the various wood using industries. If a lumberman knows that the production of his dimension mill is standard for an industry or several industries instead of merely being the requirement of an isolated plant, he will have no hesitation in undertaking to manufacture against any orders he may secure, and in a conservative way, to manufacture against the probable requirements of the industry as a whole. On the other hand, the wood fabricator will not hesitate to place his requirements with certain mills, when he knows that he is protected by a lumbering policy which is producing the exact stock he uses, in other mills than his contract source.

Standardization will serve also to eliminate another grave evil, altogether too common in the past. Reference is made to disputes between producers and consumers as to whether the stock furnished is according to specification. Sometimes these disputes have not been a fair question between the parties. They have been unfair attempts by one of the parties to void a responsible contract. With standardization in effect, such disputes can be settled by a neutral third party, or otherwise authoritatively disposed of.

In a single word, the standardization programme rests on the two fundamentals of making it as safe to manufacture or buy dimension stock as to manufacture or buy merchantable lumber. The committee on standardization proposes to press this programme not only because of its great economic benefits to both lumbermen and wood users, but also as a conservation measure, second to no other, in the great patriotic enterprise of saving our forest resources.

Engineering in Furniture Industry

(Continued from page 73)

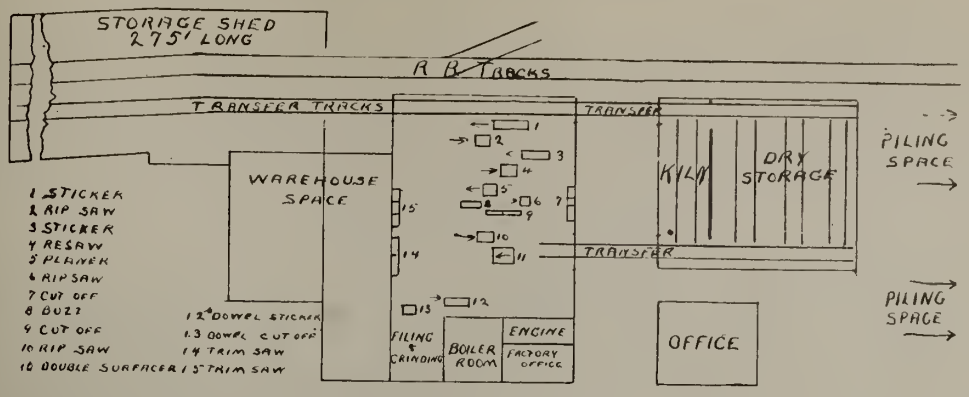
ing may be obtained through a proper selection of reflectors or fixtures at a comparatively small cost in power consumption. For the average machine and bench work in a furniture factory an intensity of illumination of 3-foot candles will be found satisfactory and this intensity may be obtained with the Type C lamps for a power consumption of about 1.25 watts per sq. ft. of lighted floor space. Fixtures or reflectors should be selected to suit the various departments, the selection depending of course upon the kind of work performed. The new enameled steel reflectors, which are made in a variety of styles and designs to suit various conditions will be found very efficient and probably as economical in first cost as any type of fixture that can be purchased. Care should be exercised in locating fixtures over machines or benches so that the direct glare of the lamp will not shine in the workman's eyes. Where such direct rays of light are unavoidable, opal-glass bulbs should be used.

With regard to heating probably the most ideal system is the hot-blast, for such a system provides adequate ventilation as well as heat and in the summer time may be used to cool the air introduced into the factory by circulating cold water through the heating coils. The hot-blast system has the disadvantage of rather high first cost in comparison to direct radiation, and the ducts for distributing the air are likely to be considerably in the way unless provision for them is made in the building construction. A well-designed direct-radiation system of heating will be found very satisfactory and will probably answer the purpose in most cases. Pipe sizes should be liberal so as to use exhaust steam from the engine without too high a back pressure, and the pipe coils or radiators should be so arranged as to obtain a uniform distribution of heat and flexibility of control.

An Eye to Comfort and Convenience

The toilet and locker rooms should be centrally located with regard to the building or floors which each serves, and preferably placed in a service wing, as already mentioned. By so locating these features valuable manufacturing space is not taken up and good light and ventilation may be obtained. Toilets with divided front counterweight seat, extended lip, and of the automatic flushing type should be installed; one for each 20 to 25 men. These toilets may be used for urinals and will be found to give much less odor when so used than but the most expensive urinals. Washing facilities should preferably consist of enameled roll-rim cast-iron sinks with no stoppers in the waste. Hot and cold water supply pipes over the centre of sink with mixing valves, similar to bath cocks, spaced about 18 inches apart for both sides of the sink, will provide a maximum of capacity per square foot of floor space. One wash cock or mixing valve should be provided for about every 10 or 12 men. Such equipment has the advantage that it is easier to keep clean than individual wash basins and forces the men to wash in running water, an important point in preventing the spread of disease. Every man in the plant should be provided with a pressed-steel locker where he may change his clothes, and the addition of a few showers and a comfortable, well-lighted room where the men can eat their lunches will be found to be not only conveniences provided by a generous management, but features which add still more to the contentment and loyalty of the men. Floors in all toilet, locker and wash rooms should be waterproof and non-absorbent so that they may be easily kept clean and sanitary.

As mentioned before, these few notes are not intended as a treatise on the design of a furniture factory, but merely as a brief discussion of some points which the writer feels are worthy of serious consideration. The many factors affecting the design and construction of a plant are so important in their bearing on the final overall efficiency of the plant, that the problem is quite properly one for none but an experienced engineer.



Sketch showing layout of plant, P. W. Gardiner & Son, Galt, Ont.

Specializes in the Standardized Line

Penalizing Special Work Has Tended to Focus Production on Stock Lines— Better Service and Prices Through Elimination of Odd Jobs— Efficient Storage and Handling Facilities

One of the most interesting industries in Galt, Ont., especially from the viewpoint of a woodworker, is the large door factory operated by P. W. Gardiner & Son. The term "door factory" is used advisedly, for while other lines are produced, they are carried on as side lines to the main operation, which is the quantity production of interior and exterior doors. The other articles manufactured include sash, turned columns, mouldings and interior trim.

This business was founded in 1900 by P. W. Gardiner and his son, J. E. Gardiner, and has grown and expanded in a very gratifying manner. The manufacturing operations are under the supervision of R. R. Gardiner, a brother of the senior member of the firm. The factory and warehouse facilities have been enlarged and added to on several occasions, until to-day they occupy buildings having a total floor space of 35,000 feet. In addition there are lumber storage sheds, dry kilns, garage, etc.

Excellent Storage Facilities

The long storage shed for rough and finished material is worthy of special mention. This building is 275 feet long and has both factory and railway trackage running its entire length. One side of this building is devoted to storing door stock and other material that is usually purchased in a dry condition. The other side, part of which is double-decked, contains manufactured mouldings and other stock in addition to rough lumber. This huge shed makes them independent of weather conditions, loading and unloading being carried on without hindrance and without exposing the stock to rain or snow. The factory trackage feeds the stickers in the main plant and is carried through the kilns and dry storage. This facilitates the handling of the raw material.

The stock for the doors is brought in on kiln trucks to the Yates double surfacer, where it is dressed on two sides. It is then ripped to width, the material being cut so that it works to the best advantage possible. From the rip saws it goes to the trim saw and is cut to the different lengths and is then passed to the warehouse where it is segregated and stored in orderly piles.

The breaking out and the subsequent manufacturing are conducted as two distinct operations or departments. After the material has been dressed, ripped and cut to length, it is passed to the warehouse from which it is drawn as required by the door manufacturing department. There is always enough stock ahead to make each department independent of the other. The trim sawyers are furnished with complete cutting lists for the full line of doors and work all stock to the best advantage. The foreman of the breaking out room keeps his eye on the parts stored in the warehouse and if he sees any items which appear to be running low, he instructs his men to concentrate on that part for a little while.

This system is not so complicated as it may seem for the number of designs have been reduced to a minimum and the parts standardized. Thus a 6 ft. 6 in. stile or a 3 ft. 0 in. rail will do for many different styles of doors. It has the advantage of enabling each department to work independently of the other, avoiding vexatious hold-ups and delays and enables production to be maintained at capacity.

In the door-making department, which is on the second floor, when the material is brought in from the warehouse, the rails and muntins are run through a double end tenoner and then through the door sticker. The stiles are bored on a special automatic boring machine, capable of handling two pieces at a time, and go from there to the sticker. Special rail boring and dowel driving equipment has been installed to handle that end of the operation. The panels are worked out on the resaw, planer and trim saws on the lower floor, then sanded and if required raised or moulded in the door-making department. The pine doors are sanded on a drum sander while the hardwood ones are finished on a belt sander. The normal output of this department is around 300 doors per day.

Turned Columns a Specialty

All rippings from the door stock which are suitable, are worked up with the sash and turned column material. The manufacture of these columns is a very interesting operation. The strips or staves are first dressed to the required thickness and then run through a special column stave jointer. This machine makes a tongue and groove joint at a suitable bevel, but the

unusual feature is the way the side heads are mounted and controlled. These may be set so that they will taper the staves from end to end or so that the staves will be wider in the centre than at either end, making a column with a swell centre of entasis. It can also be set for straight jointing and is thus used for all core stock for veneered hardwood doors.

After jointing, the staves are glued in special forms, casein glue being employed, using special chain clamps. The columns are now turned off and then fluted on the shaper. This fluting is done in a special carriage which carries the columns past the shaper head. The shaper spindle has been extended, raising the head well above the table, and an arm with top bearing attached. The cutter is mounted between two collars which are shaped to conform to the curve of the column. This does away with the necessity of using a guide, the columns being grooved against the collars.

Effort to Standardize Product

The sash equipment consists of the usual sash sticker, tenoner, mortisers, arm sander, clamps, etc. While stock sash are produced, most of the sash are made to order. This differs from the door department, where as far as possible everything is stock. By raising the price on special doors, in small quantities, particularly, and explaining that the line manufactured covers all ordinary requirements, special order work has been discouraged. It has been found that to interrupt production, to put through a small order for odd or special doors so increases the cost that even raising the price a few dollars does not reimburse for the loss of time and the additional work involved. The point is a good one. If a concerted attempt were to be made to penalize and discourage special designs in doors, sash and mouldings, it should increase the demand for stock material and thus ensure a market for stock items as well as result in reduced costs.

Storage shed 275 ft. long provides excellent facilities for loading and unloading stock.

The mouldings produced consist of the usual line of items for the interior and exterior decoration of the home. A suitable range of patterns are manufactured and every effort is made to work to standard so that the last batch of mouldings will match, in every detail, some turned out last year or earlier. This means that the dealer does not accumulate odd stock as the new lots always match the old.

When one considers that quality of the product is the first and main consideration and that sufficient stock is usually on hand to give prompt service it is not to be wondered at that P. W. Gardiner & Son have succeeded in building up a satisfactory business, among a large number of dealers, in doors, sash and building trim.

American Furniture Men to Advertise Product

The Furniture Publicity Bureau, which is to carry on an extensive advertising campaign for the furniture industry in the United States, has been organized on a permanent basis. The publicity work of this organization is being supported by both the retail and manufacturing branches of the industry, and will be conducted on a large scale. An effort is being made to collect an initial campaign fund of $1,000,000 and it has been decided that active publicity work will not be undertaken until this amount is assured.

The constitution of the newly-organized bureau is as follows:

ARTICLE I.

The title of this Bureau shall be **The Furniture Publicity Bureau.**

ARTICLE II.

The object of this Bureau shall be to educate the manufacturers and distributors of furniture and also the general public, so that:

(a) Through the spread of public knowledge and understanding about furniture, its true service value as ministering to the stability and happiness of American home life may be better realized.

(b) To emphasize the Essentialness of Furniture shall be the main function of this Bureau.

ARTICLE III.

The membership of this Bureau shall consist of manufacturers and distributors of furniture whose application has been approved by the Executive Committee.

This Bureau shall have an Advisory Board made up of men from producing and distributing branches of the Furniture Industry.

The direction and control of the Bureau shall be vested in an Advisory Board.

ARTICLE IV.

The annual meeting shall be held on the second Thursday of January of each year, at which the election of the Advisory Board shall take place. Those having the highest number of votes shall be declared elected.

Following adoption of the Constitution and By-laws the following officers were duly elected:

President—P. E. Kroehler, Kroehler Mfg., Co., 14 E. Jackson Blvd., Chicago, Ill.

Vice-president—J. L. Young, Young Furniture Co., Cleveland, Ohio.

Secretary—Wm. B. Baker, 531 Monadnock Bldg., Chicago, Illinois.

Treasurer—C. S. Dexter, Grand Rapids Chair Co., Grand Rapids, Mich.

Executive Committee for three year term—M. W. Hubbard, Buschmann-Hubbard Co., Cleveland, Ohio; Z. G. Simmons, Simmons Co., Kenosha, Wis. Two year term—John A. Thompson, Aexander H. Revel & Co., Chicago, Illinois; W. J. Wallace, Berkey & Gay Furniture Co., Grand Rapids, Mich. One year term—M. Lammert, Lammert Furniture Co., Inc., St. Louis, Mo.; Ralph W. Taylor, Jamestown Table Co., Jamestown, N.Y.

Building Up an Efficient Organization

Shortage of Capable Woodworking Executives—Provide Sufficient Raw Material in Shape of Ambitious Employees—Secure Co-operation by Just Recognition of Merit

By W. Warren

There is, without doubt, a serious shortage of men willing and capable of qualifying for executive positions in our woodworking organizations. This dearth of suitable men has been brought about from various causes, one of the principal of which is an unwillingness on the part of those higher up to perpetuate their profession by handing on knowledge they might possess to an apprentice or understudy. Quite frequently one comes in contact with an individual who fondly imagines that to pass on any information will enable those following to become contestants for his position. A man of this kind is living entirely in the present, all unmindful of the future, and is a misfit of little or no commercial value.

One of the inherent qualities of mankind is to perpetuate the race. A man who really loves his profession should desire to perpetuate that calling, secure in the knowledge that in trying to improve his understudy, he is strengthening his own position and maintaining a lead that can only be assured in that way. He is doing his part toward elevating the standard of his profession.

Test of Any Organization

It matters not what our position may be—manager, assistant, foreman, or any executive position whatsoever, we should at all times arrange our work so that in cases of enforced absence it will still go on without friction or loss. Our work may run along with clocklike precision when we are present, but unless it goes along with the same lack of confusion should we be absent, then we are a failure and most certainly lack organizing ability. The battery must be so charged that it will function properly if left alone for a period.

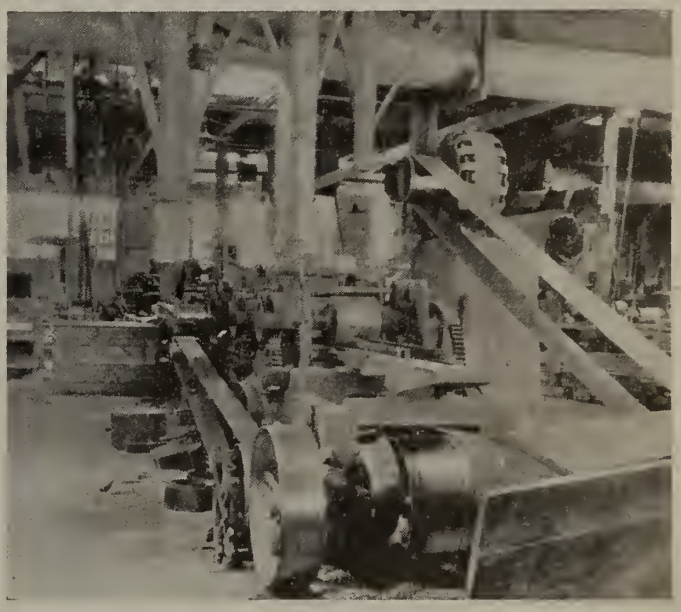
We do not pay sufficient attention to the training of new men, nor do the young beginners give adequate thought to the trade or profession of their choice. Our managers, superintendents and foremen, are nearly always drafted from the yard, mill or factory employees, and for this reason it is of utmost importance that a supply of good, intelligent, enthusiastic men be continually in the making.

Labor Uncertain Factor

The human element is a tremendous factor in the woodworking business. We would not think of attempting to carry on without making provision for future stock. In this we are continually looking ahead, while to a large extent, we make little or no provision for our future needs as regards labor, though our finished product consists in the main of labor and material. In estimating, we have to consider both factors. We can easily estimate the material, because it possesses a definite value at point of destination, but here the labor with all its uncertainties steps in.

The cost of unloading and piling; the cost of kiln drying; the cost of manufacturing; undue waste during process of manufacture; the proper care of machines to ensure a minimum in loss of time and power, repairs, shipping, etc.

The cost, on the above-mentioned items, may, and quite frequently does, fluctuate 50%, according to the efficient or inefficient way in which they may be handled. It will be seen from this how uncertain any labor estimate really is. The remedy is entirely in our own hands and seems to me to be just this: Create a feeling of loyal, cheerful enthusiasm among the executives, and let it be generally felt that work well and efficiently performed will not pass unnoticed or unawarded. Like a ripple on the ocean, it will reach the remotest operators and reduce handling and manufacturing cost to a minimum. It will not only remove uncertainty, but it will tend to keep the workman's interest centered on his work, to the exclusion of extreme views, antagonistic to his employer and incidentally to himself.



Individual drive, motor belt connected to sticker.

This may sound utopian and chimerical, but if put into practical use, will create a recruiting ground capable of supplying a man for every position in the woodworking business and efficiency will be emblazoned in all actions.

The Seemingly Unimportant Things

Eternal vigilance is the price of good work. It is the little things that slip past us that cause most of our troubles. In this age of hustle and bustle the tendency seems to be to look after the larger items and allow the little things to take care of themselves. If we were to revise the process and pay particular attention to the little things, the seemingly unimportant items, the larger details would not require attention. Let us make a resolution that from now on we will carefully scrutinize all details of the work that passes through our hands and our department and see if we cannot eliminate many of the minor troubles with which we are confronted as well as raise the quality of our product. Remember it is the little things that count.

Competition in the Millwork Business

Industry Must Be Placed on Stable Basis—Wide Variation in Quotations Results in Air of Uncertainty Among Consumers and Causes Hard Feelings Between Operators

By C. B. Harman*

Fair, wide open, intelligent and discreet competition should prevail always, as it produces a wholesome feeling among sellers and buyers; stimulates business; affords the opportunity to manufacturers to improve their selling methods and opens up the way for improved construction and better working conditions for the employees. Orders secured fairly and intelligently makes life worth living. It makes a fellow feel happy, friendly to his rival, it brings a free conscience and affords one the means of giving a customer a square deal for his money and willingly.

Regardless of the law on the subject, it would be unjust, unwise, unprofitable and morally criminal to stifle or restrict competition of the fair, wide open, intelligent and discreet kind. When a seller makes an order in which he knows he has a fair profit, he has nothing to fear, to be ashamed of, to keep secret or regret. He feels happy and obligated to the customer and himself to furnish gold bond material, full measure, strictly up to specifications or better. He knows that the buyer has been fair to him, that he secured the order on its merits and that he carries the good will and respect of his competitors who lost out. He feels the importance of having added something to the good morals of his business.

Webster defines competition as: "a competing; a contest; rivalry. Surely when making up this definition Mr. Webster did not have in mind the present day competition, contesting, strife for superiority, emulation or rivalry as carried on among mill work manufacturers and others who sell our products. He no doubt contemplated that there would be fair, wide open, intelligent and discreet dealings among men.

Unfair, secretive, incomprehensive, indiscreet and uncertain competition should and must be condemned —it reflects ruin, disorder, disaster and loss—it makes enemies among men, it creates a sad and mean feeling and possesses one of the devil, casting gloom and darkness everywhere. Its the exact opposite of sunshine and happiness.

As an illustration: Six millwork factories called upon to figure a set of plans for a special house bill —all of these factories kept their books in a systematic manner, all have some approved system of keeping cost, each one knows what he is doing and can do, each have estimators properly qualified who are constantly provided with cost records covering labor, raw materials and overhead expenses or burdens. Their bids go in and run about as follows:

Factory No. 1	$9,865
Factory No. 2	9,800
Factory No. 3	9,640
Factory No. 4	9,580
Factory No. 5	9,275
Factory No. 6	9,000

The bids are opened on a certain day, each factory has his man call to see how he stands for getting the order. Factory No. 6 is awarded the business. The others remark; 'This is some mighty close figuring boys," feel satisfied, congratulate factory No. 6, go merrily on with no hard feelings, no complaint, and with an air of confidence and satisfaction. Why?

Four other factories are called upon to figure another set of plans for a special house bill—all of these factories keep their books in their pockets or scattered around the office on hooks, in the table drawers or on top of the table—some of them put in a cost system last year but it cost too much to keep it up and dropped it—their "guestomators" are put to work with no knowledge of wages, cost of lumber and no information about overhead expenses and are told to "go to it, we are short on orders and want that bill and remember the last bill we figured against competitor Smith he beat us 40 per cent; don't let him get away with it this time."

The result of this logic is that the bids go in about as follows:

Factory No. 1	$9,685
Factory No. 2	6,750
Factory No. 3	6,300
Factory No. 4	4,500

And then what happened?

The customer very clearly sees the very wide variation and nine chances to one calls in Factory No. 4 and says: "Here, old boy, we promised you the preference on this order, 'but you are too high,' bring down your price to $4,000 and we close the order with you now." Factory No. 4 scratches his head a little and says, "How about the other bids." Friend customer says, "All right, if you don't want it I'll telephone 'Smith' and he will come up at once and I will sign up with him." The trick is turned. Factory No. 4 says: "Give me $4,250 and I take the order." The customer hands over the order and then comes the fireworks. The other factories come along and observe that factory No. 1 has outguessed them to the tune of difference of $5,365, $2,250 and $1,800. They, of course, go away disgusted, feeling mad, mean and with murder in their hearts. Old man Smith has three confirmed enemies for evermore and eternity. Factory No. 4 goes in with the order and no doubt looses a few thousand or more and never knows it, but at the end of the year he beats his chest and pleads with his banker about renewing that note and goes off hunting or to the woods, when he gets a letter from some of his creditors saying that they will be up to see him next week.

A little further on, friend customer turns down all the inside trim, the stairs and raises cain about things in general. The architect sends over full size details that were never seen before, and so it goes. And forever afterwards these four factories fight each other as cats and dogs and refuse to serve on the church council with each other. What a contrast—what a difference between the fair and unfair, the intelligent and the incomprehensive, the discreet and indiscreet, the certain and uncertain and between them who love and admire each other and them who hate and envy.

A membership in some reliable trade association will smooth out all of these wrinkles, it will make friends, satisfaction and happiness.

*Secretary, Southern Sash, Door & Millwork Manufacturers' Association.

Dry Kiln Heating System, Automatic Control

Even Distribution of Heat First Essential—Length of Drying Period Not Most Important Item—Uniformity of Results the Test

By Benj. D. Curtis

As an illustration of the laws of evolution when applied to industry, I have seen within the last ten years, a complete change brought about in the design and construction of Lumber Dryers. It has only been a few years back when nearly all Dry kilns were built in the form of a long tunnel, operating on a progressive method of drying, where the lumber went into the dryer at the loading end, passed through progressive degrees of heating and humidity and being moved from the other end in a dry condition. It is not only natural but desirable in this type of

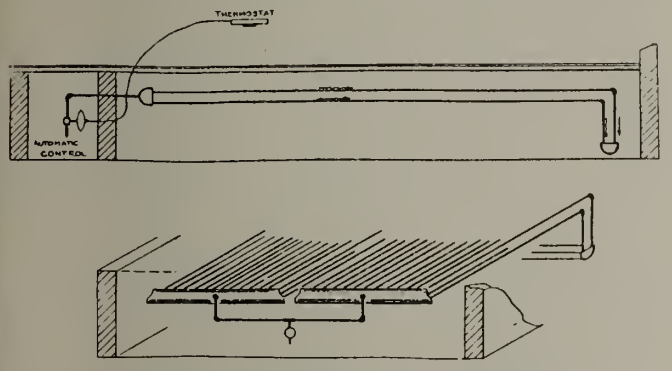


Fig. 1. Typical horizontal header system.

Dry Kiln to have the Heating System designed so as to produce a graduated temperature and relative humidity.

To-day, the progressive type of dry kiln has gradually given way to the more improved type of what is known as compartment dry kilns. This change in the construction of lumber dryers has been brought about on account of the more complex manufacturing conditions of wood-working industries principally because numerous additions during the last few years have been made in the commercial woods. Wood-working industries that a few years ago would have been using only one or two kinds of woods would probably be found to-day using from a half dozen to a dozen different kinds. This naturally means that the dry kiln equipment must be designed to meet these changed conditions.

Importance of Heating Unit

In the compartment type of dry kilns the kiln is filled entirely at one time with woods of uniform dimensions and texture. This means that to uniformily and evenly dry the entire kiln full of stock it is absolutely essential to have even distribution of the drying elements—heating, humidity and ventilation.

The heating system is the heart of the dry kiln, as it is the heat that produces the motive power for moving the air currents, therefore, a faulty designed heating system that does not uniformly distribute the heat over the entire kiln would naturally cause uneven circulation of the air currents and produce uneven drying of the stock. I have seen a great number of improvements in the last few years in dry kiln construction but I feel safe in making the statement that there has been less attention paid to the proper designing of the heating system than to any other part of the kiln. In fact a number of heating systems installed in dry kilns to-day are practically the same as were used in the old progressive type of kiln.

Even Distribution Essential

The modern type of compartment kilns are generally built in batteries, each compartment arranging from 20 to 50 feet in length. In the operation of a compartment dry kiln the temperature is generally started at 110 degrees or 120 degrees and gradually increased from day to day finishing at 160 degrees or 170 degrees. Most of the kilns being installed now are equipped with automatic controls for controlling temperature and humidity. With an automatic control attached to the heating system it is only possible to control the temperature inside of the dry kiln at the point where the thermostatic control is located, therefore, if the heating system is designed in accordance with Figure 1, and it is desired to set the control so as to carry 110 degrees of heat this would mean that as soon as the temperature reached 110 degrees at the thermostat inside of the dryer the steam valve would be throttled down and this would set up a condition whereby the heating system would not receive enough steam to reach the opposite end of the heating coils and would thereby cause uneven temperature between the two ends of the dry kiln.

The heating system shown by Figure 2, while an improvement over that shown by Fig. 1, will also bring about an uneven heating condition. This heating system is constructed in units so as when low temperatures are desired all but one or two of the units can be closed off. This would bring about even distribution lengthwise in the dryer but would cause uneven distribution crosswise. It also has the

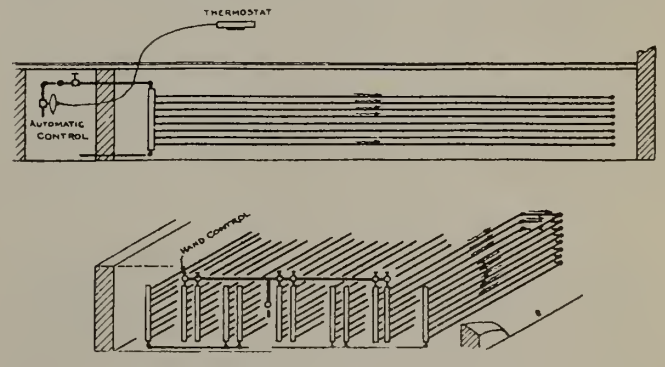


Fig. 2. Vertical multiple unit header system.

disadvantage with automatic control of being only semi-automatic, as the separate units desired have to be controlled manually and cut in or out as the temperature is raised or lowered.

Assists Automatic Control

The heating system shown by Figue 3 is a new method of design that has been especially arranged for compartment kilns, and to also work in harmony with automatic control devices. This heating system is a multiple unit system with return bend coils. The

separate units are connected to one main supply to which the automatic temperature control is attached and the steam is distributed evenly crosswise in the dry kiln and an even distribution is also secured lengthwise by use of the return bend system. The temperature in a dry kiln with this heating system can be gradually raised from 110 degrees to 170 degrees and automatically controlled. Whether the temperature desired is 110 degrees or 170 degrees an even distribution of the steam and heat is always insured both crosswise and lengthwise in the dryer thereby insuring even circulation and eliminating uneven drying of material.

While I fully believe in automatic temperature control for lumber dryers, I contend however, they are

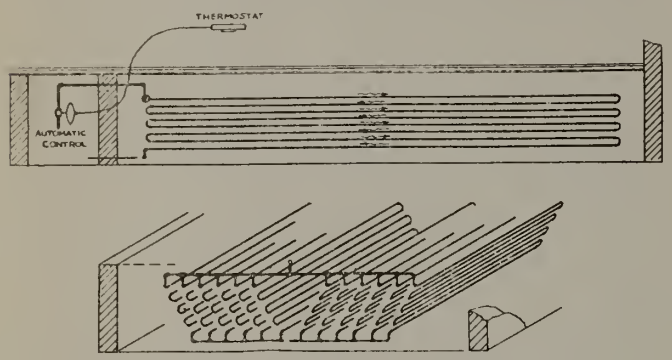


Fig. 3. Multiple unit, semi-vertical, return bend system.

of but little value unless the heating system inside the dry kiln is so designed that it will work in harmony with the temperature control. Nothing will be gained by the operator by having an automatic temperature control on the dry kiln unless he can absolutely depend on the heating system giving even distribution over the entire dry kiln at any temperature desired. As stated in the forepart of this article, the temperature control can only control temperature inside the dryer at one point, i.e., where the thermostat is located.

In operating a dry kiln the operator has nothing to guide him as to what the conditions are inside of the dry kiln except the recording thermometer, if he is fortunate enough to have one of these on the dry kiln, and the same is true of the recording thermometer as of the automatic temperature control. It can only indicate the temperature at one point inside the dry kiln, and if the heating system is unevenly distributing the heat, the operator has no way of knowing this from the recorder on the dry kiln.

Heart of Dry Kiln

It will therefore follow that no dry kiln produces uniform and even drying of the lumber by equipping it with recording thermometer and automatic temperature and humidity controls unless the mechanical equipment inside the dry kiln has been properly and carefully designed so as to produce the conditions desired, so that the operator may know, if his recording thermometer and automatic controls are set to secure a predetermined condition over the entire dry kiln.

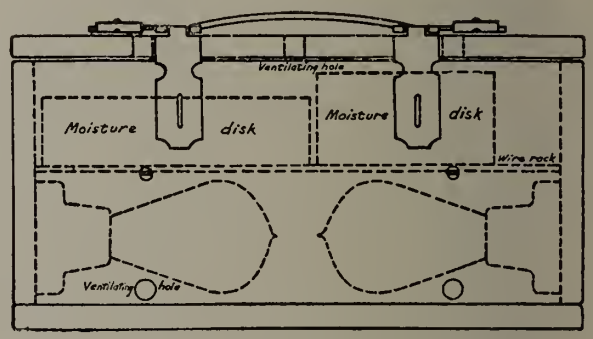
Lumber that has been unevenly dried will cause more trouble when manufactured, than if it had not been dried at all. The dry kiln that is so designed and constructed that will uniformly dry lumber is a more valuable asset, even though it takes twice as long to dry the lumber, than a dry kiln that produces uneven drying. The whole success of uniform drying in a lumber dryer is in the design of the heating system. The heating system is the heart of of the dry kiln, and if the dry kiln has heart trouble it is certainly time to consult an expert.

Portable Electric Drier for Drying Kiln Samples

The Forest Products Laboratory has devised a portable electric drier for drying moisture-determination disks. It consists of a sheet-iron box 4 in x 13 in. x 6¾ in., lined with a layer of asbestos one-half inch thick. The heat for drying is supplied by two 40-watt, carbon-filament lamps placed in the bottom of the box. Immediately above these lamps is a wire screen on which the disks to be dried are placed. Ventilation is obtained by eleven holes, ⅜ inch in diameter, six of which are in the cover, three in the back near the bottom, and two in the front A cord and plug attached to the drier make it possible to connect it to any lamp socket.

Inch disks are easily dried in this apparatus in twenty-four hours. The maximum temperature attained is 230 deg. F., which is reached only if the disks are allowed to remain in the drier for several hours after they are bone-dry. A slight scorching of the disks occurs under these conditions, but for all practical purposes this does not cause any appreciable error in the moisture calculations.

The weight lost by the disk in drying is the weight of the moisture that was in it. This weight divided by the weight of the dry disk times 100 gives the



Electric drier that may be attached to any lamp socket.

percentage of moisture in the stock in the kiln at the time the sample was removed.

This drier is very well adapted to commercial practice. It can be carried around the plant, and used in any place where a lamp socket is available. It may be enlarged by increasing the width and the number of lamps.

A Radical Departure

In describing a new type of phonograph which the British Polyphon is attempting to place on the British market, an English contemporary, says that the introduction of this machine is an interesting departure and one fraught with many pitfalls. A touch of humor is lent to this remark by the illustration which shows a case copied from a Canadian upright cabinet in Jacobian design. As the market for upright cabinets is developed it should mean some business for any Canadian phonograph men who care to go after it.

When cutters have to be made in a mill, it is advisable to use a good carbon steel so that they can be properly hardened.

Canadian Pianos in Scotland

Construction Might be Cheapened—Could European Methods of Finishing be Adopted to Advantage

By Gordon B. Johnson

Canadian pianos on sale in Scotland possess many admirable features and compare very favorably with English and German makes. It is gratifying to observe this, and to see the result of this important branch of Canadian industry in the finished article standing alongside competitive makes. The market is quiet at present in common with most other trades, particularly those which are most affected in periods of depression such as the world is now undergoing.

It is perhaps unnecessary to say that the greatest opportunity for an outlet for pianos in this country is in a good sound article at a comparatively cheap price. Pianos laid down in Glasgow at a price to the importer of £50 to £55 have the readiest chance of attracting customers. It is stated by one of the largest importers and dealers in Scotland that Canadian prices are too high. Adverse exchange and freights partly account for this, but both are in course of improvement, and in manufacture itself prices might be materially reduced without impairing the quality of the instrument.

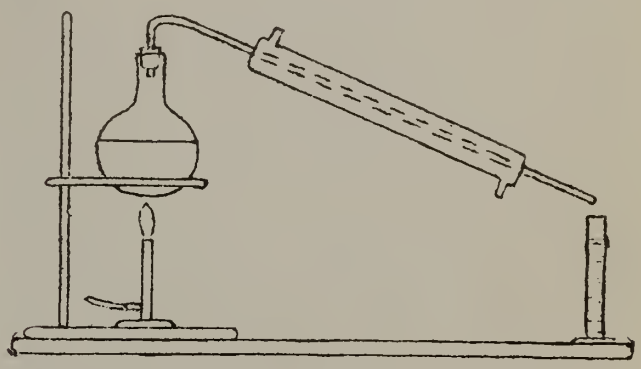
For example, in one make of comparatively low price four heavy posts of hardwood are used at the back of the case as a structural support. It is said that these are not needed, a much lighter form of construction, and of pine wood, being quite sufficient, resulting in a considerable reduction in cost. In another Canadian make, the case is built of 5-ply wood, evidently with the object of protecting the instrument against the extremes of temperature experienced in Canada. Such construction is not needed here for that purpose, and apparently a 3-ply casing could be adopted.

In the matter of varnishing and polishing there is an opportunity not only for a reduction in manufacturing costs, but also for a considerable improvement in quality. This is a most important point, as the American system used in Canada is distinctly inferior in its result to the practice in vogue in England and Germany. The Canadian pianos on view here can be easily scratched with the thumb nail, while the English and German makes have such a hard finish that it is difficult if not impossible to make any impression on it. On these instruments French polish is used. The French system consists in oiling the bare surface, then filling it in until all pores are closed up. Afterwards it is varnished with thick varnish, allowed to stand until hard, and then sand-papered. This varnishing and sand-papering is repeated three times. The next operation is finishing off in thin varnish of spirits and oil. It is stated that the Canadian method of varnishing costs $25 to $30, whereas the French system would cost $10 to $12. Canadian manufacturers who have been advised by importers here to use the French method have replied that French polishers cannot be had in Canada. They are available in Glasgow and could no doubt be induced to try their fortunes in Canada.

The question of design in external is an important one. What suits Canadian taste in this respect is not necessarily appreciated in this country. The only difference which arrests the attention is the portion of the case which closes over the keyboard. The Canadian design in this feature is squared in section, and works on two sets of hinges. The easily-marketable piano here must be rounded in section and work on one set of hinges. A change in this respect to suit the taste of the buying public would affect sales favorably.

Determining Moisture Content of Wood

A method used by the Forest Products Laboratory for determining the amount of moisture in chips and sample borings from large pieces of wood requires little equipment and only a few minutes time. The moisture content of pulpwood chips can be found by this method in from 7 to 10 minutes.



Device for quickly determining moisture content of sample borings.

A specified weight of wood chips, usually 100 grams, is immersed in kerosene in a flask or retort, and the mixture is heated. The water in the chips changes to steam at 212 degrees, and goes out through a glass tube in the cork of the flask, is condensed by a water jacket surrounding the tube, and caught in a measuring glass. The boiling point of kerosene being higher than that of water, all the moisture will be driven off the chips before the oil vaporizes to any great extent. The oil that does go off in the form of vapor is condensed and caught in the same graduate with the water. When the evaporation of moisture is complete, the oil and water are allowed to remain a few minutes until the water has all settled to the bottom of the graduate. The amount of moisture in the wood chips is then found by a direct reading.

This method has been checked for accuracy with the method of weighing samples before and after oven drying, and the variation found to be less than one per cent.

Highland Stock Softer and Finer

Harold E. Everley, assistant sales manager of the W. M. Ritter Lumber Co., Columbus, Ohio, takes exception to a statement in the article entitled "What Kind of Oak Do You Prefer?" which appeared on page 95 of the April "Canadian Woodworker." The suggestion is made in this article that wood grown in the warmer, milder climate of the South is softer in texture and possibly more even and finer in grain than that grown in the more rugged northern climate and that timber from high-land is harder in grain and texture than that from low-land. Mr. Everley states that the opposite holds true; that woods grown on high-land are softer in texture and finer in grain than low-land stock. The reason for this is that the timber on high-land does not grow as quickly as that situated on low-land.

Situation Calls for Close Co-operation

Base Costs on Replacement Values—Freight Rates Keep Lumber Prices High—Immense Field for Development—Box Industry Basic One

By B. F. Masters, Chairman, Board of Governors*

(Concluded from April Issue)

I think it is a fundamental principle in business that a man can't sell his goods below cost. We have stood upon that principle, and I think as a principle it is still true and still a good one, but in our industry it is probably wise in many instances to sell our product below cost because we must with other industries suffer the deflation and liquidation to which I have just referred, and if we sell it below cost the next test is the replacement value. I do not think men are foolish to sell their product below cost so long as they are getting as much or more than they could replace it for. If we have large inventories of lumber that cost us a great deal more than it is selling for today, many lines of lumber have shrunk in value from 40 to 50 per cent., it may be good business to sell your product upon the basis of what you can produce it for on the replacement value of lumber.

Now that alone is an opening, not an opening but an opportunity I may say for the people to go out and sell their product at a low price, feeling in their own minds that they are going to replace their lumber later on at a still lower price, and the tendency has been, and prices have been made recklessly and freely everywhere without regard to the cost, market value or replacement value, market values changing perhaps, and a very difficult and intangible item at this time with the fluctuating prices in lumber. I am speaking more particularly of Chicago because with the various sources of supply here there is less stability in the price of lumber perhaps than any other commodity sold on the market.

Consider Your Competitor

But after all, are we not in the same boat, and do we gain anything by attempting to reduce our stocks of lumber and keep our factories in operation by quoting prices that take some other man's business away from him and puts it into our shop? My thought of the whole thing is that we have become a little panicky as an industry, that we have failed to recognize the principles of reciprocity that this Association was governed by for a great many years, and successfully governed by, and which led to the higher plane of development, of mutual confidence and of the courtesies of the trade and the ethics of the trade than any other principle that we have ever applied in the box business.

Let us not get away from that. Let us keep this thought in mind that whatever your burdens may be you are in the same class as the other fellow. I find as I talk with my friends in the business I get some comfort out of it, that I am not much worse off than they are. I find it is not always true that a man who goes out with a very low price and tries to take your business away from you is able to produce it for any less money than you are. He is just frightened a little more than you are or he needs the money worse than you do or possibly thinks he is a little smarter than you are, and wants to scoop some of your trade and keep his factory running. I think that this tendency is dying out year after year, because as we know each other better we find we are all pretty smart and the fellow who thinks he has it on the other fellow generally gets left.

I do not suppose there is any industry better able to meet the conditions confronting us today than the box industry. I think the lumber industry upon whom we depend for our raw material have had more vicissitudes to meet than we have had. I think they are still having greater difficulties. In many sections weather has contributed to that to a greater extent than it contributes to the box industry. I am speaking of that as an industry separate and apart from the lumber industry, though many box manufacturers manufacture their own lumber and in that event they have the same conditions that the producer of lumber has.

High Freight Rates Responsible

In connection with the cost of raw material I am not here to apologize for the high prices of lumber on the part of any lumber men who do overcharge us, but we must not overlook certain fundamental facts and that is that the advance in freight rates has a great deal more important bearing upon the delivered price of lumber than any advance in the cost of lumber or in the price of lumber. As a concrete instance of what I have in mind, I will not go to the extreme of the Pacific Coast but take the southern lumber that comes into the Chicago market on a rate of perhaps 42 cents or $14 a thousand, freight deducted from the f.o.b. Chicago price leaves about $8 for No. 2 gum in Chicago. That is a specific example; it leaves about $8 for f.o.b. the mill. I can remember when we paid $16 for gum, and freighted it for $8, and it still netted the mill men $8, and they said they couldn't make it then at any profit, but they are selling that lumber today at the same price f.o.b. the mill as they did fifteen years ago, but there is a difference of six or eight dollars a thousand attributed entirely to the advance in freight rate from which nobody gets any benefit, not even the railroads, because of the cost of transportation.

There was a meeting in Memphis about two or three weeks ago. The hardwood manufacturers were petitioning the southern railroads for a lower rate on low grades of lumber. I think they wanted to work it out upon a basis of the ad valorem rate, that the price of lumber would regulate the rate to some extent. There may be a lot of objection to it, but the railways said' Will you increase the tonnage if we make you a lower rate on low grade lumber? The lumber men put up the further argument that under the present conditions there was a great amount of timber, a great number of logs left in the woods to rot, because they could not market it at a profit and I think you all know that that is true. Lumber men are not cutting their timber as close. They are letting trees stand in the forest because they can't get the cost and the freight out of them. They are leaving top logs that would have a value for box material if it could be marketed. Well, the lumber men would not give any assurance in that respect, and consequently no action was taken and probably will not be, but for years we have been talking about conservation, conservation of our forest

*Address National Association Box Manufacturers, Chicago, Ill.

products, and we are confronted today with a condition that instead of being conservation is forcing absolute extravagance. Who is to blame for it? I don't know.

Work for Good of Industry

I do not know of any panacea that will cure all these ills. The only thing I know is to go ahead and do the things we have been doing for a number of years, for twenty years, that is, working together shoulder to shoulder through this Association to protect ourselves against these ills that are thrust upon us and against ills that thrust themselves upon us, and against all the adversities that our industry is heir to by nature of its environment and condition. There is no ponacea that will cure trade ills of today. There is no one thing that will turn this old world around and head us the other way. It takes a combination of all the good things that the minds of men can contrive and work out.

We need this Association because there is no other organization through which our mutual complaints and our mutual requirements and necessities can be handled. I do not mean by that that local or district at present in this association in which the problems are the same as they are in all other districts, and there are many problems that confront our industry as a whole that are mutual and affect us all just the same. Therefore, the membership of these various districts through the national body affords to my mind the best and the only means of continuing to work out the problems that confront the box industry of the country today.

Push Publicity Campaign

I know it is difficult to become enthused over Association work just at this time when we do not see tangible results. It may be difficult to recommend and to spend our money for advertising because we do not see tangible results, but advertising is perhaps the most intangible thing that enters into business, and yet advertising men and men who have made a study of it will tell you that they can sell anything at all if it is properly advertised. The result is intangible so far as placing your finger upon the point of origin, but everybody knows that nation-wide advertising has brought prominently before us many things that are today being marketed extensively and profitably, things that at one time perhaps failed because they were not properly marketed or advertised and brought before the public. So the wooden box has its place in this advertising campaign. I could not tell you the last number of shippers, in fact, I would hesitate to make a comparison of the number of packages that are used in shipping the commerce of the United States that moves in other than wooden boxes. You have an immense field for the development of the wooden box. Our business is just as essential as any industry in the United States. Let us not for a minute get the thought in our mind that we are engaged in an industry that is becoming obsolete, or that ever will become obsolete, because we will use wooden boxes as long as we are here to make them.

What we need is a faith in that principle, a faith in our industry, a faith that we are engaged in an industry that is essential and necessary, a faith that we are engaged in an industry that is legitimate, in an industry in which we can help each other through co-operation, a faith in this Association, a faith in each other, and if we adhere to that principle I am sure the future has better things in store for us than we have been enjoying for the past few months. I thank you.

Box Manufacturers Must Sell Service

"He who serves best profits most." The box manufacturer is in a position to give a form of service to his customers that will win business and foster goodwill. He will prosper just in proportion as he is able to serve. There is more to a box than two sides, two ends, a top and a bottom and there is more to selling boxes than beating the other fellow's price. If you have studied the strength, construction and design of boxes and packages so that you are able to work out a set of specifications covering a box for a given purpose and can convince your prospective customer that your box will carry the goods safely, keep freight charges down to a minimum and save time and labor in the packing and handling of the product, service becomes the first and price the second consideration. Your ability to give this service will also determine whether you secure business on a price or quality basis.

That proper design, proper thickness of material and proper nailing and strapping play an important part in the box industry, should not need discussing. To-day we are not selling just so many pieces of dressed lumber but so many shooks or boxes that will stand up and give service, at a minimum cost and with a minimum loss. If in this endeavor to produce a box that will stand the racket the material used is heavier than necessary the customer and the ultimate consumer pays: First in the higher cost of the box, second in higher freight charges, and third, in damaged goods and loss of contents, for it has been demonstrated that a box made of needlessly heavy material will break down quicker than one constructed of lighter but more suitable stock. It is estimated that the excess material furnished by box manufacturers in one year, that is the excess consumed in making boxes and shooks needlessly thick, amounts to 1,500,000,000 valued at $120,000,000. This a direct loss to the manufacturers. In addition there is the freight which is paid on this large quantity of useless material.

On the other extreme are found the boxes that are too light, that do not carry through, but spill their contents here and there,, while on the road to their destination. A box that does not give satisfaction is a source of untold annoyance, it injures the reputation of wood boxes as good containers, results in endless strife, damage claims, ill-feeling, loss of time, loss by theft and general dissatisfaction.

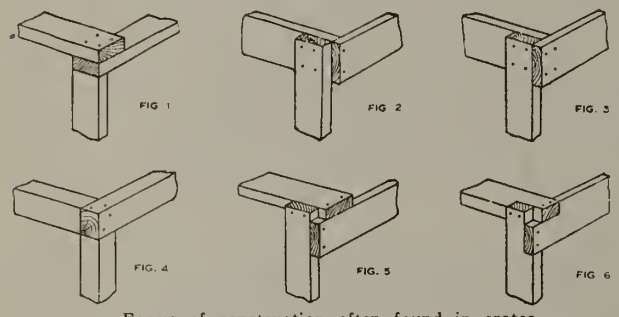
Between the two, lies the ideal box, designed to carry a specific article and deliver it safely at a known destination. It is neither too light or too heavy, it is properly reinforced with strapping and braces and is nailed to give maximum service. In other words, it is the most box for the least money. The box manufacturer who has studied his product, its design, application, construction and service given and expected, need not fear his competitors nor the competition of substitute containers, for he is able to consult with his customers and advise them as to what is best suited to their requirements, save them money and give 100 per cent. value.

Corner Weakest Part of Wooden Crate

"Three-Way" Construction Gives Best Results—Nailing to End Wood to be Avoided—Suggestions for Nailing and Bolting

The corner is the weakest part of the ordinary crate. Some facts about crate corners observed in tests at the Forest Products Laboratory may be of assistance to crate builders in strengthening this weak part by better arrangement of members and methods of nailing or bolting.

An example of expert crating frequently met with is that shown in figure 1. This construction is poor because the nails holding one member are driven into end grain and so have comparatively low hold-



Forms of construction often found in crates.

ing power. Another common example of the same fault is shown in figure 2. This construction may be improved (fig. 3) by lengthening the member to permit nailing into the side grain.

Construction to be Avoided

The corner construction shown in figure 4 is very weak, because the only nailing possible is through one member into the end grain of the other two. This style of corner is frequently used in crates which are to be entirely covered with sheathing. In a crate without sheathing it would, of course, be worthless.

In figure 5 each member is nailed to another member and has the third member nailed to it. This is a very effective arrangement. It is called the "3-way" corner, and the distinguishing feature is that each member is held by nails or bolts in two directions. Figure 6 is suggestive of further variations of the 3-way principle, with the members notched together.

Seldom if ever does the 3-way corner construction increase the volume of the crate. On the contrary it usually reduces the space occupied. When properly nailed or bolted, this type of corner has a considerable bracing effect, although it does not do away with the need for diagonal bracing.

Types of "Three-Way" Corner

The sixteen possible arrangements of members at a 3-way corner are given in figure 7. It will be seen that A and I are the most practical when the object to be crated is a box-like form, such as a filing case. When the object is of irregular form, such as an electric motor, one of the other arrangements may have the advantage of permitting better bracing and blocking.

Proper arrangement of members will not in itself produce a good corner. They must be properly fastened together. Whether bolts or nails should be used depends principally on the thickness of the members, the amount of stiffening afforded by sheathing, and labor costs.

Nails driven in holes slightly (1/32 to 1/16 inch) smaller than their diameter have considerably more resistance both to direct pull and to shear than nails driven without holes.

Cement coated nails are superior to uncoated nails.

Length of nails should be somewhat more than twice the thickness of the member holding the heads.

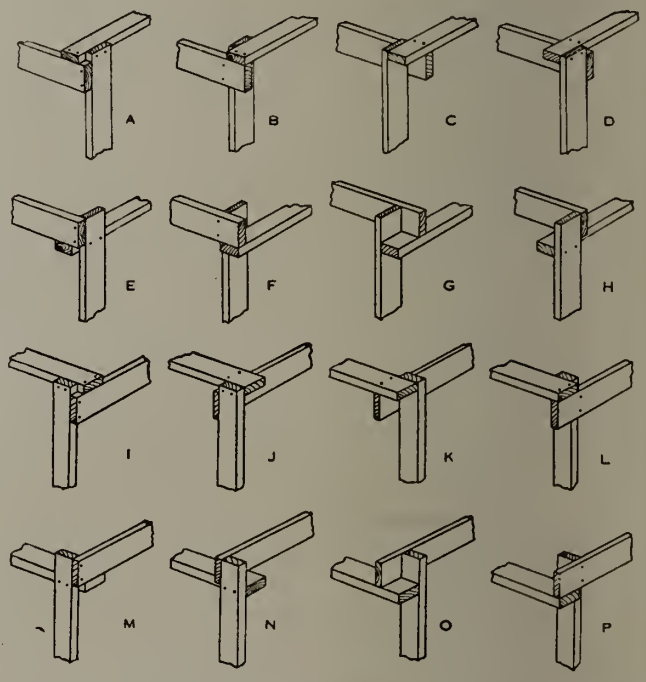
Slender nails are likely to hold better than thick nails under the repeated shocks and constant weaving action to which crates are subjected, because the slender nail bends near the surface of the pieces joined without loosening the friction grip towards the point.

Number of nails or bolts joining one member to any other member should not be less than two. Usually as many nails as can be driven without splitting should be used.

Danger of splitting will be reduced if nails are staggered. Boring holes for nails also reduces the danger of splitting.

Bolts Make Strongest Crate

Bolts have the advantage of holding after the friction grip of the wood on the shank is destroyed. The following schedule of bolt sizes is suggested as a guide:



Different types of 3-way construction.

Thickness of crate members	Diameter of bolts
Up to 1½ inches	⅜ inches
1½ to 3 inches	½ inches
3 to 5 inches	⅝ inches

Machine bolts should have washers and the heads should be countersunk.

Carriage bolts are preferred to machine bolts and may be used without washers under their heads.

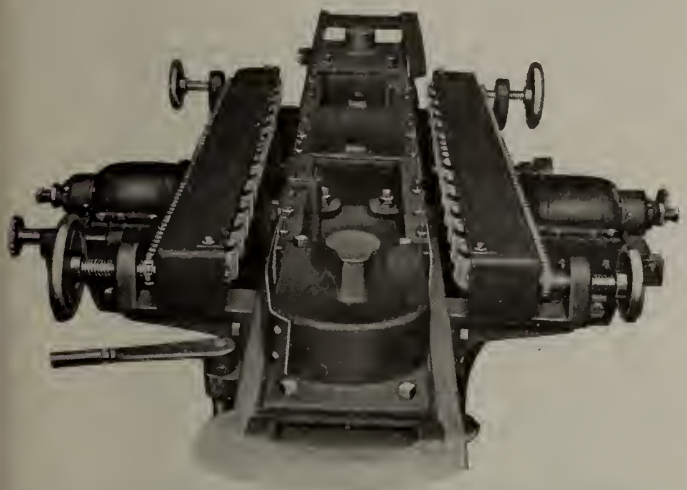
Nuts should if possible be on the inner side.

Holes for bolts should be bored to the same diameter as the bolts—or 1/32 inch smaller.

Machinery & Equipment

Direct Motor Driven Glue Jointer

One of the latest developments of ball bearing direct motor application is the No. 429 Automatic Glue Jointer and Edge Molder, which J. A. Fay & Egan Co. are making at their plant in Cincinnati, Ohio. The new development is creating quite an interest in the woodworking industry. This latest model is made with a series of extra pressure rolls at each cutter head, so that it can be used as an edge molder



Ball bearing, motor driven glue jointer.

working stock as short as 4 in. at a greatly reduced cost as compared with work done on a shaper, jointer or tenoner. These extra rolls improve the quality of work on long stock by holding it rigidly while being passed over the cutter heads. Particular attention is called to the extended table model for planing out of wind and jointing long stock, such as is used in building tanks, silos and aeroplanes. This machine works material from ¼ in. to 3 in. thick and from 1 in. up to any width, and 4 in. up to any length desired. Table is made in three lengths. The frame is cast in one piece, insuring absolute rigidity. It is cast open and all parts are easily accessible. One important feature in its construction is that all the bearings are oiled from the outside and therefore it is not necessary to stop the machine to oil any parts. The No. 429 is equipped with individual high speed motors mounted in housings directly on spindles. Motors are alternating current only for two or three phase; 60 cycle and any voltage.

Direct Motor Driven Mortiser

Another application of direct motor drive in the construction of a woodworking machine is shown herewith. It is a Whitney Horizontal Bit Mortising Machine, manufactured by Baxter D. Whitney & Sons, Winchendon, Mass.

A high speed alternating current motor is mounted directly on the spindle. The motor housing is a part of the head block that carries the spindle and bearings all of which slide back and forth as a single unit to make a mortise of the desired size. This application eliminates all extra bearings as the same bearings serve for the spindle and the motor.

The table is supported on a knee that is raised and lowered by means of a handwheel which quickly sets it for the various sizes to and from the bit by means of a conveniently placed lever that operates a rack and pinion feeding mechanism.

The head block carrying the spindle and motor oscillates from side to side through a distance equal to the length of the mortise to be cut. The movement of the sliding head is such that the end of the bit travels on a straight line and makes a mortise of uniform depth the entire length. This block is driven horizontally back and forth by a motor through a crank shaft, which in turn drives a connecting rod fastened to the head block. The ends of the rod can be adjusted to give the desired stroke to the head block to cut any length of mortise up to 6 inches. The head block has two rates of feed, 150 and 200 strokes per minute. The change in the feed is secured by the operation of a lever.

The machine will cut any size mortise up to 1½ in. wide, 4½ in. deep and 6 in. long. Table will drop 5 in. This machine is also furnished equipped with a power feed for table.

Some of the advantages claimed for this type of mortising machine are: The elimination of countershaft and belts and a saving in floor space; can be

Horizontal bit mortiser, motor driven.

erected and operated in any desired place, regardless of shafting; it is an independent and compact unit; has a constant and steady bit speed and a true and even-running spindle, and there is no slowing up of the spindle due to belt slippage.

You will break the chain of the mortiser if you neglect to sharpen it.

Split Tilting-top Saw Table

A very handy combination boring machine and variety saw, with tilt table top is being placed on the market by the D. McKenzie Machinery Co., Guelph, Ont. The accompanying illustration shows this machine with half of top set at an angle, permitting bevelling to be carried on conveniently.

Handy saw showing split-tilting table and boring attachment.

Any angle up to 45 degrees may be worked. The table is rigid and accurately machined and the fences and gauges move freely. The boring attachment is complete in itself. The table is actuated by the foot lever shown. A large coil spring located in the column of the machine automatically releases the work from the bit when pressure is removed from the foot lever. The mitre fence can be set to forty-five degrees and locked in any position. The boring attachment is raised or lowered by means of a hand-wheel connected with a pair of mitre gears. The spindle is bored to take standard size bits and can be arranged for a hollow chisel mortiser if desired. Saw arbor takes saws with one inch hole. The base of this machine may be arranged for direct motor drive if required.

Killing Molds on Lumber by Steaming

Molds thrive on the surface of wood when it is moist and warm. In a dry kiln molds often develop on the surface of the lumber to such an extent that they seriously obstruct the circulation of air through the pile. This is such a decided hindrance to successful kiln drying that steps must be taken to prevent the mold growth. Various experiments have been made by the Forest Products Laboratory to find a means of accomplishing this result without injury to the lumber.

The safest method found for stopping the growth of mold on lumber in a kiln is to steam the stock at 170 of 180 degrees for a period not exceeding an hour. This treatment heats the surface of the stock sufficiently to kill the mold, and at the same time the saturated air prevents too rapid surface drying, so that the injurious effects which otherwise would be produced on the wood by such high temperatures are avoided.

Unless it is desired to relieve drying stresses at the same time, the interior of the stock should be heated as little as possible. Therefore, the steam supply should be sufficient to reach the desired temperature in 25 or 30 minutes. To accomplish this result, plenty of live steam at a pressure of at least 70 pounds gauge must be available. The size of supply line and the number and size of perforations that may be required in the steam jet line will vary with local conditions; it is impossible to make them too large or too numerous, as the quicker the steam is supplied the better the effect.

Care should be taken to see that the stock cools in nearly saturated air. Otherwise the surface will dry too rapidly, and casehardening difficulties will set in.

Electric Edge Veneer Trimmer

The accompanying illustration shows a portable electric edge veneer trimmer adapted to trimming the uneven ends of casket boxes. This machine was originally designed to trim edge veneers and is being generally used by furniture factories for that purpose. It is operated from a large lamp socket and consumes very little current. Operator slides the tool alongside the projecting edge like a flat iron; the high speed saw makes a clean, uniform cut, trimming the stock perfectly flush with the surface. Stock up to

Trimming edges of casket boxes with portable veneer trimmer.

¾ in. thick is trimmed much faster and more evenly than is possible by ordinary hand methods. Can be equipped with motor for either alternating or direct current of 110 or 220 volts.

In the modern drying plant the humidity and the heat can be regulated to suit every class of timber from green oak planks to thin pine sidings.

Upholstering and Trimming

Upholsterers in Annual Convention

Successful Gathering is Held—Questions of Interest to Industry Discussed—Hours of Work Considered

The annual meeting of the Upholstered Furniture Manufacturers' Association, held recently at White Sulphur Springs, W. Va., was an unqualified success. A gratifying number of members attended and the discussions which took place and the business which was transacted was of vital interest to the industry. The president, A. D. Gorrell, presided.

The president, in his address, touched on work of the association and conditions in the industry. He quoted from a report issued by Babson, in which it is stated that the upholstered furniture industry has about completed its liquidation of prices, and in this report it is the only craft in the furniture industry which has done so. The one branch of the industry, that has the most liquidating to do and which in fact is retarding the resumption of normal business in this particular line, is the retail section.

The practices carried on by some of the smaller manufacturers of upholstered furniture of selling to the dealer less the covering, or of having the dealer guarantee the manufacturer's account with the jobber of covering material, was condemned as being unethical. It gave the dealer an advantage in price and worked a hardship on the legitimate manufacturer who carried a stock of covering and sold his goods in a finished state. Such a manufacturer must make a profit on the covering carried and supplied, and is thus at a disadvantage in competing with the smaller man who secures his covering through the retail furniture dealer. A resolution was passed as follows: "It is the sense of this Association that jobbers furnishing supplies to the manufacturers of upholstered furniture should abolish unethical practices in the merchandising of their goods."

The question of hours and wages came in for a considerable amount of discussion. While no definite action was taken, it was suggested that a 48 hour week is too low and 54 hours too high, and that a week of 52 or 52½ hours would be a good compromise, although the attitude of many of the members present was that 50 hours constituted a satisfactory working period.

Price-cutting came in for its share of attention. It was brought out that at the exhibition held recently in Grand Rapids, there was only one instance of where a manufacturer of upholstered furniture resorted to price-cutting. It is felt that in every instance the selling price should be based on proper costs. It was suggested that price-cutting was a short-sighted policy, which, if indulged in might demoralize the upholstering industry to a point which might take years to bring it back to the position it occupies to-day. Mr. Karpen maintained that only a certain amount fo upholstered furniture can be sold, and when a manufacturer cuts his prices, he does not increase the total volume of business being done but simply takes some trade away from his competitor. In view of the fact that there is a scarcity of upholsterers and many plants are behind with their orders anywhere from four to six weeks, it would appear as if there was not any real reason for price-cutting.

Considerable discussion centered on the question of cancellations. It was felt that this evil should be eliminated and that the members take action both as individuals and as an association to remedy this serious condition. It is intimated that in many cases the manufacturers themselves are to blame. The dealer buys a bill of goods and next day a salesman for a rival firm comes along and quotes a much lower price. It is only natural that the dealer should feel like cancelling the first order and buying at the lower figure. In this connection the following resolution was passed: "Resolved that it is the sense of this meeting that all cancellation of orders is very disturbing to business, and steps should be taken that the business interests of America abolish such practices."

The next subject for discussion was the necessity for the better packing of furniture. It may not be long before the railroads will refuse to accept crates of furniture, upholstered furniture particularly, in which the openings in the crate are wider than 6 inches. The case goods people propose making a test by sending various pieces of furniture, crated for shipment, to the Forest Products Laboratory at Madison, where they will be put in a tumbler and tested under conditions which would approximate these which prevail in shipment. It is hoped in this way to obtain information as to the best methods of packing and crating.

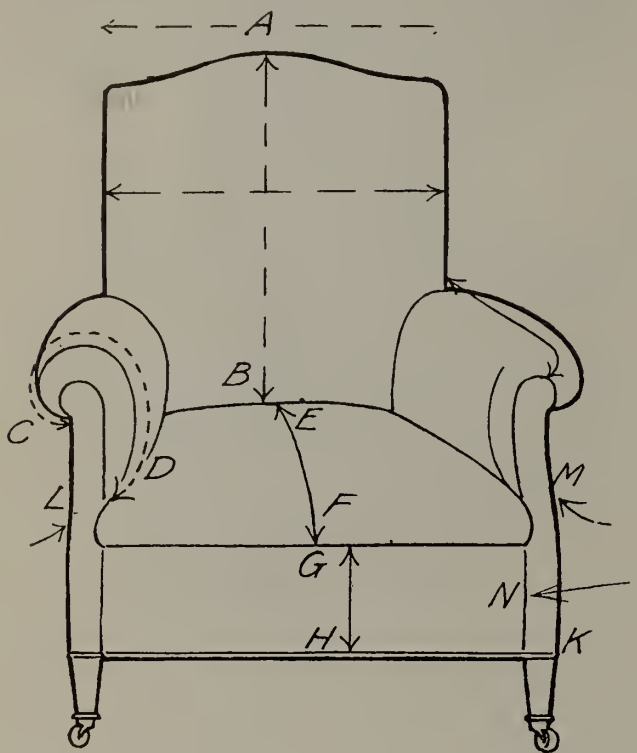
Attention was directed to the newly-formed furniture publicity bureau, of which P. E. Kroehler, a member of the upholsterers' association, is president. In discussing the value of publicity, reference was made to the results of the advertising campaigns carried on by the Simmons Co. of Kenosha. Mr. Simmons, of this firm, recently made the statement that they were going to spend $1,000,000 this year in a publicity campaign. He also stated that they expected to hold up the prices of their line, and made the further statement that the month of March was 70% of the largest month in the history of their organization. He attributed this entirely to their publicity work. He believed that if the furniture industry would spend a very small percentage—about ½ of 1% of total volume of business done in an effort to create a desire on the part of the public for better-furnished homes, the furniture business would be increased many times. The per capita expenditure in the United States for furniture is in the neighborhood of $2.00 as compared with $21.00 for automobiles. It is felt that judicious advertising would divert more of this money into the coffers of the furniture industry.

The following gentlemen were elected to office for the ensuing term—president, A. G. Gorrell; vice-president, W. H. Gunlocke; treasurer, L. L. Vallantyne, and secretary, B. D. Fennell.

Keeping Down Upholstering Costs

Judicious Use of Extensions Results in Lower Costs—Suggestions for Cutting and Planning

Extensions or straining pieces are portions of material other than the covering joined to it at various parts to increase the size. A saving can be effected by this method, but upholsterers must not overdo it, says Frederick Palmer in "Practical Upholstering." Economy must not be carried to the length of giving a maximum of extension and a minimum of covering



Chair No. 302, showing pieces of covering required

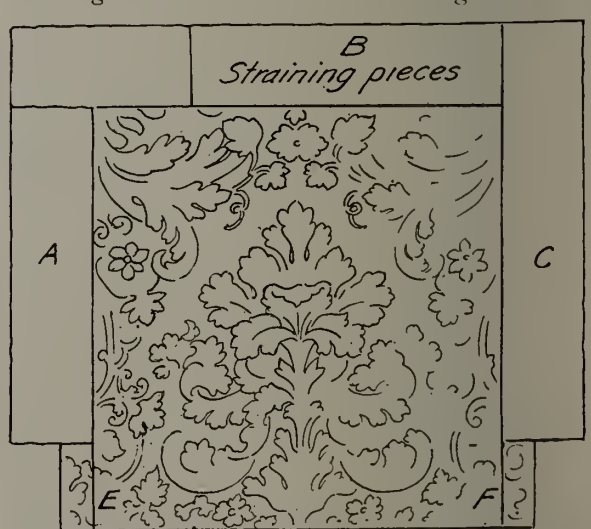
material. If it is, it becomes a source of complaint on the part of customers. The use and abuse of extensions will now be explained.

The approximate amount of double-width material needed for a chair might be 3½ yards, whereas without extension pieces this quantity would not be enough. In that case the various pieces are extended by adding strips of another material, as shown in the accompanying sketch. To dispense with extension pieces would considerably increase the cost of upholstery, and there is no disadvantage in their use if they are placed in the correct positions and strongly sewn. Extensions should be formed of a strong thin material according to the nature of the covering used. For tapestry ordinary calico strips may be used; for morocco or imitation leather black linen is preferable; but whatever the substitute it must be remembered that it has to bear a large amount of strain and pull, and that this is greater on plain work than buttoned work. Extensions should be placed in such a way that they are not visible at any part of the work.

In cases where economy has been carried too far—that is to say, where there is too little covering material and too much extension—the extension is liable to become visible and unsightly in compression, and as the purchaser is not generally aware of this device for economising material complaints frequently arise when it is found that a different fabric has been used. Thus the use of extensions, though perfectly legitimate, becomes a source of annoyance when the practice is abused. The pieces of velvet which surround rugs and carpet squares (i.e., saddle-bags) are also termed extensions.

Plain velvets and self-colored materials, when accurately measured and skilfully planned, are most economical, because no matching is required. Velvets are now woven double width, following tapestry measurements, and replacing the old-fashioned 24 in. widths, which necessitated many joins. Joins or seams in plain velvets are very noticeable, but figured velvets can be matched with ease, and in some designs they can hardly be detected unless pointed out. It is important when cutting velvet to lay the various pieces over the work, so that the shading tones correctly. As a general rule, the darkest shade of a velvet is more pleasing than the lighter ones. In cutting lengths of covering material for an ordinary stuffover chair eight or nine pieces are required, apart from those for joining. A great saving of time is effected when these are marked with chalk, commencing from a first cut, either top or bottom. Some varieties of velvet are very difficult to shade correctly, and often appear to better advantage when placed in the opposite way to which they have been cut. The cutting and matching of velvets by artificial light should be avoided. Good natural light is absolutely necessary for plain velvets, but in figured varieties not so essential, because the pattern forms a guide to correct cutting.

The beginner who is fortunate enough to learn his



How extension reduces quantity of covering.

trade in a shop in which a variety of work is done should constantly make notes. He will find these invaluable when the opportunity arises for him to cut his own materials. Many useful hints in connection with cutting can only be gained by observation. Some upholsterers waste a deal of time through planning out carelessly or not planning at all. The beginner should form the habit and strictly adhere to the rule not to commence cutting until quite sure that he has sufficient material. Careful planning creates confi-

dence when cutting, because the upholsterer has made sure of his ground and has left nothing to chance.

The best method of obtaining measurements from a double-width material is to calculate by half-widths. In cutting for small chairs, loose seats, and stuffover work, calculations are best made from the half-width. For example, the measurement of a small chair would be taken from back to front, and sufficient for two obtained from the full width. In easy chairs the half-width rule applies, and the width is increased by matched extensions of the same material when necessary. Figured designs of a set pattern in tapestries and brocades are generally duplicated in the double width, so that by cutting in the centre the pattern is the same on either side. The example shown at Fig. 302 is a simple stuffover chair for which eight distinct pieces of material are required independent of those for facings and extensions. The names of the cuts are: inside arms, outside arms, seat, inside back, outside back and border. To measure for the inside arms insert the tape between the arms and seat to a depth of 4 in. at D and measure, following the line of arrow, to C underneath the arm. The seat and back sizes are obtained in the same manner, B to A for the back, E to F for the seat, the tape being inserted at E to the depth of 6 in. instead of 4 in. The border, G to H, requires an additional 3 in. on the net measurement. For the outside arms, L and M, and outside back, A, sufficient material must be allowed to fold at the top, also 1 in. to tack underneath the frame. The planning of the material for a chair already second stuffed in a calico or underlining is less complicated than when the calculations must be obtained from the first stuffed stage. This is the chief difficulty experienced by a beginner in his first attempts at cutting out, and it is necessary for success that he should be able to visualise the work as it will appear when finished.

(Continued in June Issue)

Cottonwood for Crossbanding

Cottonwood is a difficult wood to peel, but when cut smooth and properly dried, it is unexcelled for centres, corestock and cross-banding. The fall downs make excellent egg cases, as the wood is light, odorless, tasteless and nails well. Small pieces are used for cleats, mirror backs, washboards, toys, etc.

Cottonwood must be cut with a sharp knife as the wood has a strong tendency to wool up. It is cut cold, as steaming increases this tendency to become woolly.

It is necessary to dry cottonwood slowly as it contains a high percentage of moisture, and will warp and curl all out of shape unless dried with the circulation across the grain and with the ends and centers of the sheet held down with a weight. Cottonwood has a strong affinity for mould, and if not dried promptly after cutting will sour and mould badly. It is impossible to ship cottonwood any distance green, due to this cause. The best shipping condition for this wood is about 25 per cent. moisture content.

The core or block which is left from the log after peeling has a value for pulpwood. Cottonwood cores when dried make an excellent fuel for a hot blast furnace. They are used in lime kilns, as they make a very hot fire.

The supply of standing cottonwood is decreasing rapidly, but owing to its rapid growth, can easily be replanted and grown under forest management for veneer logs and pulpwood.

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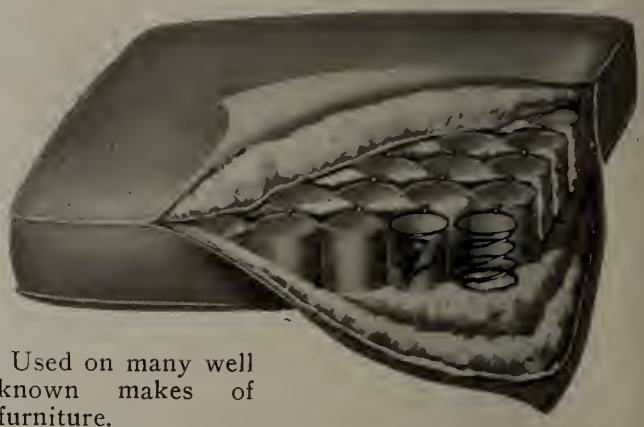

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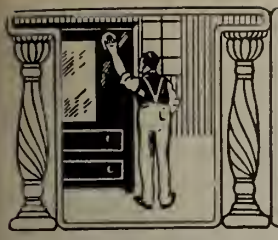
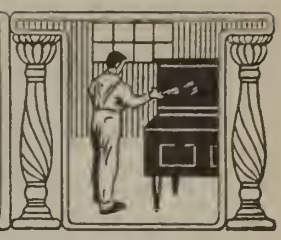


THE FINISHING ROOM



How Long Should Fillers Dry?

Writer Suggests That Five to Ten Days Not Too Long—Must be Thoroughly Hard for Best Results—Sanding Between Varnish Coats Not Required

The various methods of finishing furniture, as employed to-day in the finishing rooms of the country, make a most interesting study. It is remarkable to find how many methods are employed to obtain the same results and how the up-to-date finisher adapts his methods to his particular problem. The question of using a wash coat of shellac on mahogany before filling is one that never will be settled. Almost if not quite as many finishers fill directly over the stain as use a wash coat, though I notice that in those factories where a filler is applied directly over the stain, the work comes into the finishing room in a very smooth condition, and I also notice that in producing medium class work most factories wash coat with shellac while in the high grade work the reverse is true. But there is one point on which all well posted finishers agree and that is the necessity of having all coats including the filler coats, well dried. In fact they put special emphasis on the dryness of the filler coat before it is coated, says a writer in the "Furniture Worker." When it is impossible to allow the work to dry naturally in the required time, the drying kiln is employed very successfully.

I was inspecting one of our largest and best furniture factories recently, accompanied by the superintendent, one of the leading finishing authorities in the country. In the coating room stood a walnut suite which was intended for a wedding present for a member of the firm. In the course of our conversation concerning the suite, he quite casually informed me that he was allowing the filler to dry ten days before first coating. He had found that the longer the filler dried the better his work came through.

Allows Long Drying Period

Within the past month I have visited three prominent piano factories in the Middle West and in each case I found the finisher giving his filler coat at least five days to dry. This sounds ridiculous, I know, to the finisher who thinks the filler is as dry in one or two days as it will ever be but those finishers mentioned above have stumbled into a scientific fact quite overlooked by the majority of students of finishing. If you will flow some linseed oil on a strip of glass and weigh it every day, for two or three weeks, you will observe a peculiar condition and one quite the opposite to what most people would suppose. The linseed oil will gain in weight every day for a period of ten or twelve days, and then gradually become normal in weight again. In other words, as the oil dries it takes up oxygen from the air. It oxidizes and gets heavier in weight and while this process is going on, the mass is not inert, but changing. This change is not very great but the chemical balance shows it distinctly. Now as linseed oil is a part of the filler, this process goes on just the same in the filler as in the linseed oil, modified of course by the combination of pigment and drying oils. In other words a piece of work filled to-day and weighed to-morrow or after the volatile spirits have evaporated will increase in weight for about 10 days before arriving at a stable and unchanging condition. Those observing finishers who give their work the long drying period, whenever possible, are certain of obtaining the best results by reason of this very fact.

Judgment Should be Exercised

Of course such a long drying period is only possible on fine work and quite out of the question on the majority of the finishes made to-day, but there is always a struggle between cost and quality in the finishing room and sometimes a compromise can be affected whereby the finish is improved and the cost not greatly increased. The matter of costs is quite often a matter of individual capacity. I observed a sander recently in a cabinet shop who was as skilled in his line as any I have ever seen. He did not seem to work so fast but every motion counted. On the posts and around the carvings he sanded by hand first, and then with a block he deftly cut down the flat spaces. By actual timing it took him twelve minutes to sand a cabinet and not a corner was cut nor were any rough places to be found. He was such a skillful worker that I spoke of his ability to the superintendent who smilingly informed me that when that man fell ill, as had happened recently, it took two men to do his work. And I am not exaggerating when I say it would take a good many sanders 45 minutes to sand those cabinets as well as this particular man was doing in 12 minutes. This goes to prove that good sanders are hard to get.

Suggests Too Much Sanding

I spoke above of the compromises possible in finishing. One of the big compromises noticeable recently has been the elimination of sanding between coats of varnish. It has been contended for a long time by certain finishers and some varnish manufacturers as well, that it was quite necessary to sand down each coat before the succeeding coat was applied. It was believed that by doing this the nubs were cut off, which would otherwise protrude through the next coat and in addition the roughing of the varnish made a foundation to which the succeeding coat adhered. There was one class of finishers, however, which thought otherwise. The finishers said—use more care and don't have so many nubs and do not sand at all. They put coat over coat and obtain splendid results. I refer to the piano finishers and it is quite interesting to see how this method of finishing is gradually finding favor in the furniture factories. It saves labor and material and it always was a question as to whether the sanding did not gray the varnish. Besides, a nubby surface sanded off is no better than one directly coated over, for in each case there is unoxidized or soft varnish that should be dried through before being recoated. There is no question but that

in the elimination of sanding between coats you are getting the benefit of all the varnish you have applied with no sanded off edges to be taken care of.

Wages in Upholstering Industry

The National Association of Upholstered Furniture Manufacturers recently completed a wage survey of that industry. Information was gathered from 60 plants situated in various states. The average rate per hour paid is as follows: tally men, 57c; laborers, 42c; stock sawyer, 55c; rip saw, 49c; trim saw, 58c; band saw, 57c; joiners, 51c; planers, 51c; stickers, 59c; shaper, 61c; boring, 53c; drum sanders, 50c; belt sanders, 47c; machine helper, 35c; cabinet makers, 57c; cabinet makers' helpers, 38c; machine carvers, 65c; hand carvers, 75c; sand hands, 42c; gluers, 49c; caners, 50c; stainers, 49c; fillers, 43c; finishing sander, 41c; sprayer, 53c; toner, 54c; rubber, 50c; cutter 61c; sewer, 38c; spring setter, 41c; upholsterers, 70c; assemblers, 50c; apprentices, 47c; trimmers, 40c; packers, 49c. This survey covered the period from March 15th to April 15th, 1921.

Finishing Department Not Always to Blame

Many Troubles Formerly Passed Off on Finishers, Caused by Poorly Seasoned Stock—Foreman Should Have Working Knowledge of Succeeding Operations

By J. R. Wallace

The finishing room is often held accountable for all that occurs while the work is undergoing the process of finishing. It does not make any difference what the trouble is, whether it is open joints, warped tops, checks and face cracks, the articles were all right when taken in for finishing and the way the work was handled must, therefore, have caused the trouble. This is a very unfair attitude, for it places full responsibility upon the shoulders of the finishing foreman and his men, and in trying to find and remedy the trouble in that department, the real source of the difficulty is overlooked.

Because the joints in the top of a dresser or table open when it is being filled or stained does not necessarily mean that the staining operation is accountable. In fact it is hard to see how anyone would really try to connect the finishing with any such trouble. No doubt in the past the men in the other departments got away with a lot of crude work merely by suggesting that the finishing methods are to blame, but such an excuse does not get by any longer.

Real Cause of Trouble

The basic cause for such troubles as warping, twisting, checking and open joints is moisture and as a rule this moisture was in the wood long before it reached the finishing room, in fact was never all removed from the rough stock, meaning that the drying operations were at fault. However, the stock may have been properly dried when in the kiln but was permitted to pick up sufficient moisture to cause trouble, while awaiting entry into the factory or while going through the various operations. It is just as important to protect the stock from moisture and dampness while being manufactured as it is to see that all moisture was removed in the kiln.

The same moisture will account for warping, checking, and twisting. These troubles usually occur when moisture is being eliminated and whether the article has been given a wash coat of shellac on one or both sides or the kind of stain or varnish used has practically nothing to do with it. The same holds true when difficulty is experienced with veneered parts. Loose, blistered and checked veneers are usually attributable to the veneering operation rather than to the methods of the finishing room. Moisture in the stock is again the usual cause although loose and blistered veneers may be accounted for by uneven pressure due to a variation in the thickness of the cores or to variations in the thickness of the cauls. Here again the remedy lies outside the finishing department.

Why these troubles should develop in this particular room is that the finishing room is usually the warmest part of the plant. That being the case, it is not to be wondered at that the wood exhibits a strong tendency to dry out. This is usually, if not always, accompanied by other undesirable features. There may be rare instances, when water stain is used too freely, where the finishing can be blamed for the trouble. This usually occurs when articles on which thin face veneers have been used, are going through.

Formerly a lot of trouble was experienced from open joints and many manufacturers were at a loss as to how to account for this trouble. Now it is generally conceded that such faults as open joints, checks and warping and twisting in built-up stock are all caused by moisture in the wood. When the cause is known the remedy is obvious—greater attention to drying and keeping the stock dry. As long as there is a tendency to shoulder the finishing department with all the blame, it is not likely that the real cause will be admitted. It is up to the finishing foreman, in many istances, to convince those above and below him that the fault does not lie in the methods followed in his department and that because the articles were apparently in good shape when he received them, is no reason why he should be held responsible.

Should Know Where to Look

By recognizing that moisture in the wood is at the bottom of at least 75 per cent of these occurrences, the finishing room foreman is placing himself in a position from which he will be able to point out the cause in short order. It is up to him to defend his reputation and fight back. If he doesn't, he will often find that his position is not any sinecure. It is always well to know a little about the work as carried on in the other branches of the factory. Such knowledge often comes in handy.

A case in point is where a foreman finisher recently asked the writer how he could repair and prevent open joints in dresser tops. Naturally the reply was that this fault could be prevented by making sure that the wood was thoroughly seasoned before it was glued up. As to repairing such defects, the openings might be filled with stick shellac but unless the moisture was all out of the wood, they would probably open some more. At best repairing faults of that kind is only a makeshift proposition and should only be tried as a last resort. The better way is to remove the tops, break the joints that are at fault, dry the stock and then glue up and refinish.

Birch Takes Attractive Brown Finish

Rich, Warm Shade That Rivals Walnut—Used for High-grade Furniture—How Chrome Finish is Secured

By M. J. Dowling

The January furniture exhibitions brought out many fine examples of birch furniture finished in a rich, warm walnut tone. These pieces were received with much favor and proved to be a pleasant surprise to many, both retailers and manufacturers, who have not given the Canadian birch a second thought as a fine cabinet wood for furniture and high-class woodwork. The interest taken in these displays was such that it probably will not be long before other furniture makers will be placing birch furniture on the market. This particular finish or tone has been given different names such as "chrome-walnut," "chrome-wal" and other similar terms, though it is understood that the name "chrome-walnut" has been copyrighted and protected.

On the floor of one of the world's largest furniture stores, amid woods from everywhere and finishes of all kinds, stood the particular suite that now is in our minds' eye. It was of birch, despite the argument of those who usually know, and it seemed to reflect pride in the fact that it was so basically good and so possessed of the rich quality that was being spoken of in the highest possible terms—it was truly a masterpiece of chrome walnut finish. This period suite, distinctive because of its simplicity, was beautifully high lighted and the panels had been prepared by sanding to resemble the tones that usually come only with age. A few fine Roman gold lines gave the touch of the artistic, this being added to greatly by the treatment on the carving. Here the use of gold and a neutral shade of verde or gray-green in the depths, with a little salmon on the high lights, completed the color effect. The entire finish was produced in a few days' time, this being a feature of no small significance. A description of how this finish is obtained may prove of interest to many readers of the "Canadian Woodworker."

Ground Work Very Important

Birch being the wood in hand, it is very important that the sanding be done exceptionally well and that in the first stages the flake of the grain be fully covered. Filling can be done in the usual way and it is not absolutely necessary that it be perfect. It is vitally important, however, that a good stain be used, preferably one a little darker than ordinary Van Dyke brown. Some prefer an alcohol soluble stain to which a little acetone has been added to make it penetrate. The solid tones should be treated a little heavier if it is desired to emphasize strongly by high lighting.

The use of fine (0000) sandpaper will produce the best effect in shading and prevent defects oftimes noticed. Blend the tones well and do not make the contrast too great in the panels. Apply a sprayed coat of wood lacquer (do not confuse with metal lacquer) which contains a quick penetrating solvent that sets the color and dries in a few hours, permitting handling if necessary. This wood lacquer tends to prevent fading also, thus overcoming a complaint that, at times, is made against stained birch.

Dries in 24 Hours

Providing the sanding over the stained coat has given you the desired results, there should be no further need of sanding, but if additional tones are wanted secure them by using the fine paper again. The use of the wood lacquer should dispense with one or two sanding operations. After drying about 24 hours apply another coat of wood lacquer or a coat of good varnish. For those who admire a wax finish, it might be said that the brushing on of some thin wax after the second coat of lacquer or varnish will result in a satisfactory finish.

In the higher grade of furniture, where it is desirable to obtain an absolutely even tone, care is taken in the selection of the birch, which would mean that for each piece, material of a uniform shade and characteristic be obtained. Then if the staining process, already referred to, does not give absolute uniformity, it can be helped a lot by touching up with an alcohol stain. The entire coloring is done before finishing is attempted. Where the alcohol soluble stains are employed, they are often incorporated into a very thin lacquer solution, then sprayed with the air gun. In this case the stain is usually a shade lighter than the finished product. The air gun permits the evening up and blending of the color so that when the work is completed an absolutely harmonious and uniform surface is presented. The same procedure is also taken advantage of when high light effects are desired. The parts to be high lighted are only sparingly coated, and of course the darker parts are given more of the spray. In a measure this is largely an operator's problem, depending on the skill and eye for color shown by the man with the "gun." The operator soon becomes experienced at this, and the process is very quick. The color is thoroughly taken up by the wood because of the lacquer which carries it and which brings about the claim that fading is not as likely as if other methods are used, thus safeguarding all advantages of soluble color.

Birch, finished in this way, is endurable far beyond the usual meaning of the word as applied to a finish. It is not so easily marred, very easily cleaned and as previously stated, the entire job can be completed within three days.

To follow this method will prove the value of birch when given a proper finish. There should not be any necessity to hide the wood by giving it some high-sounding name. Those who prefer to market this wood, under its own name are assured that "Chrome Finish Birch" will sound good to the ultimate buyer, especially in view of the beautiful results obtained.

"Chrome Walnut" Registered Trade Name

The importance of the use of Canadian hardwoods in furniture manufacturing has been referred to from time to time in Canadian Woodworker, and it is interesting to note that encouraging progress has been made in this direction. The matter has been taken up by a number of furniture manufacturers and is receiving attention to a degree that it never previously attained.

At a recent meeting of the Rotary Club of Toronto, A. E. Clarke, a former chairman of the Wholesale

Lumber Dealers' Association of Toronto and a member of the Board of Directors of the Canadian Lumbermen's Association, gave an impressive address on "The Production and Uses of Hardwood Lumber," and in closing stated that the hardwood lumberman had his special place in the world, and in future when buying furniture, he, Mr. Clarke, hoped that his hearers would endeavor to purchase some pieces, at least, for their homes which were made from the products of Canadian forests. This reference was received with applause and evidently developed a new line of thought on the part of several members of the large gathering.

In retail furniture circles the problem of the more extended consumption of Canadian hardwoods in the production of furniture is coming more and more to the front. Not a few furniture retailers have from time to time made statements urging Canadian manufacturers to do more to popularize their native woods, especially birch. The Dominion possesses more birch than any other species of hardwood, while maple stands second in the list. According to the latest returns available, which cover the year 1918, the total production of hardwoods in Canada was 201,667 M feet. Of this the greatest cut was birch, which constituted 76,165 feet B.M. Then came maple with 47,884 M feet. Other species of considerably less quantities were ash, elm, basswood, etc.

The North American Furniture Co., Limited, of Owen Sound, one of the alert organizations in the furniture field, are devoting attention to the manufacture of furniture and chairs of Canadian birch, and has been particularly successful in treating them with a finish, to which they have given the name of "Chrome Walnut." The trade mark, "Chrome Walnut," has been registered by them and samples of the Chrome Walnut finish, which have been sent out, reveal a most inviting appearance. The finish is remarkable for its beauty and attractiveness. The company say they find that birch is an excellent cabinet wood.

Furniture made in the Chrome Walnut finish is not sold as imitation walnut, but as birch, and the words, "Chrome Walnut," apply only to the finish. The North American Furniture Co. say that in actual wear birch will stand up equally well with any wood and when properly finished, it has a pleasing appearance. There is no doubt if this birch was imported from some distant country, it would be regarded as one of the precious woods. We think, declares D. E. Macintyre, vice-president of the company, that every effort should be made to use more birch to the exclusion of the imported woods, especially at this time when there is an adverse trade balance against Canada, placing Canadian money at a discount.

When Saw Teeth Crumble

Who has not been troubled by crumbling saw teeth? The following explanation and suggestion by an expert saw filer may contain some valuable information:

"Whenever I found the saw teeth crumbling when I swaged them, I took an 8-inch file and side-filed them to the gauge that my shaper shaped them to; in this manner the steel of the saw tooth was worked one way and a few repetitions of this method prevented any further crumbling and a smooth cut was assured.

"In going into further details as to why I did this I will give my version of the crumbling. When teeth are swaged, the crumbling seems to radiate from the root of the swage. Now, when you work it through the shaper the steel is worked back to place. This continual spreading and compressing destroys the cohesive quality of the steel. When applying the above method, I have found that the first time, this crumbling disappears and the teeth hold their cutting edge. Always, upon taking the saw off, I note the condition of the teeth that were crumbled and if necessary apply the above method when I have to swage. If the crumbling appears again, I repeat the process.

"In addition, I might add that it is sometimes necessary to face the teeth up with a file as the grinder sometimes fails to face them up well. In my years of experience the above method has proved itself and the teeth have held up."

$1,000 Prize Won by Boy of Seventeen

Those who read our recent announcement of the award of the $1,000 prize offered by Alvan T. Simonds, President of the Simonds Saw Manufacturing Company, for the best essay on an economic subject will be interested to know that the winner, David Koch is a boy only seventeen years of age, living on the east side of New York City.

Dr. John L. Tildsley, Superintendent of High Schools in New York City, was interested to look up this boy and reported that the essay was entirely his own work, that he talked it over only with his instructor and a boy of his own age. His teacher of economics in the High School of Commerce in New York City says, "He was head and shoulders above other pupils in his economics class and knew more about economics than some of the teachers." He began to read books on economics when he was thirteen years of age, in the last year of the elementary school. He is hoping to go to college and this $1,000 which he has won will give him a good start.

Conditions in American Furniture Industry

Figures recently issued by several of the American furniture manufacturers' associations show that on April 1st the furniture industry in the States was producing at the rate of about 55% of normal. Unfilled orders averaged 27% of normal; lumber stocks 81.5%; raw materials 84%; and finished products only 96.7% of normal.

With regard to reduction of wages, 128 manufacturers were reported as having placed into effect reductions amounting to from 5% to 35% on skilled labor, the average being from 15% to 20% and 132 report reductions on unskilled labor running as high as 50% and averaging from 18% to 25%. Sixty-two furniture men had not reduced wages as yet.

This brief survey would lead one to believe that the furniture industry in the States is in a very healthy condition. The attitude of the retailers would seem to indicate that they believe that the different manufacturers are carrying heavy surplus stocks of finished material and will be forced to unload at reduced prices. By holding off, they hope to be in a position to take advantage of such bargains as may be offered. The fact that the finished products on hand on the floors of the different manufacturers have reached only 96.7% of normal would indicate the manufacturers are not to be caught napping and would seemingly show that they have reduced production to a point where it just keeps pace with the demand.

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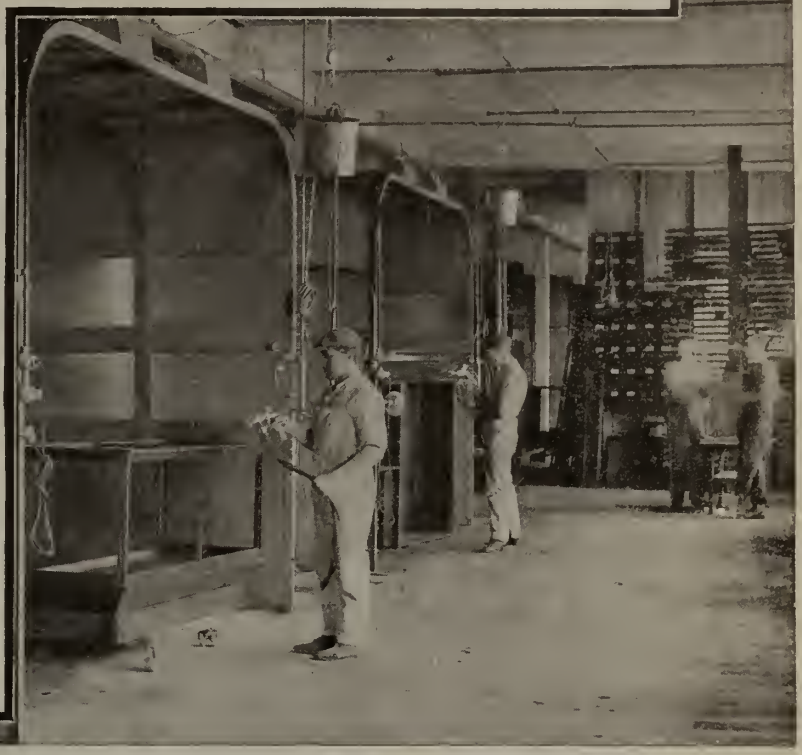

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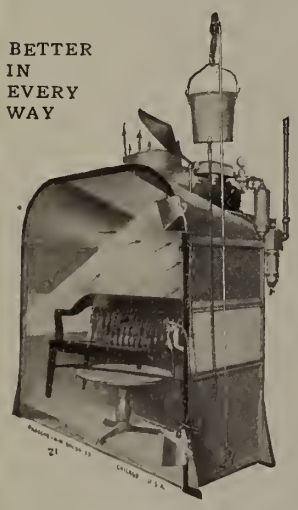

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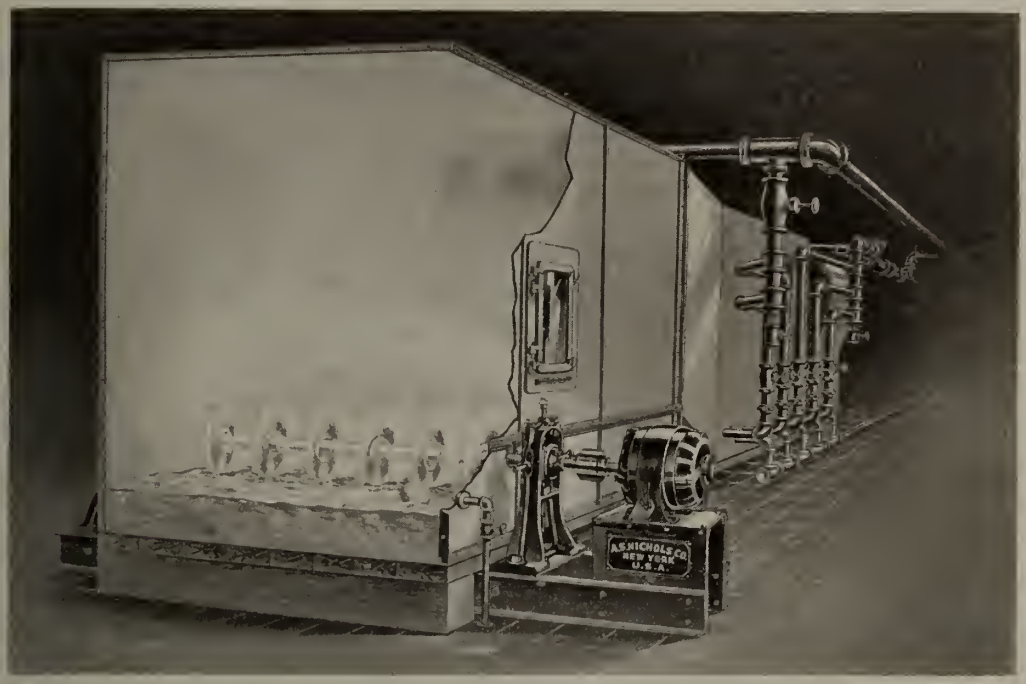

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Veneers and Panels

Plywood for Wall and Panel Work

Building Field Unlimited Market for Plywood Panels — Business Must be Developed— Method of Application Important Item

By S. H. Johnstone

The wide-awake woodworker, one who is always watching for new opportunities and new lines, will keep his eye on the panel and wall board field. The manufacturers of composition and pulp wall boards have worked up or created a wide market for their products, and there does not seem to be any real reasons why the manufacturers of veneered panels cannot "take a leaf from their book" and go after the same business. Built-up, wood-faced panels, whether with wood or composition core appear to have many points of superiority in their favor as compared with the pulp or composition product, so that the former article—veneered panels—should be able to secure a large volume of the wall board trade as well as develop new fields or markets which will eventually absorb large quantities of this material.

The veneered wall board would be far more attractive, would take a better finish—one that would improve with age. The cost of finishing, if in natural shades, would be less, they would be permanent, damp proof, slow burning and would stand up under service. As to price, they would cost little, if any, more than the common types of wall board, especially when finished, and who wouldn't be willing to pay a trifle more for a wood panel. If these points of superiority were to be placed logically and clearly before builders, contractors and home owners, both present and prospective, it should not take long to create a demand for wood panels. The individual woodworker can do a lot of missionary work and at the same time secure some what should be very profitable business. With each sale of wood panels for wall or partition purposes, an order would be secured for mouldings, batons or, perhaps, rails, stiles and mullions or, in other words, completed panel work.

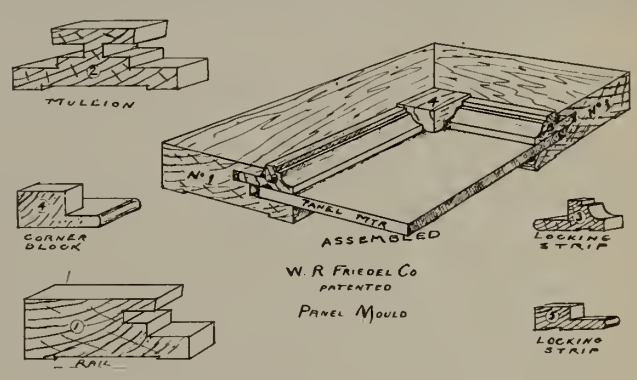
Method of Application Important

Some thought should be given to the method of attaching and using these panels, and to the details and construction of panelled partitions and wall panelling. If some form of construction could be developed that would simplify the work entailed in attaching wood panels and panelling, it would be a step in the right direction.

The accompanying sketches show a type of panel mould designed and patented by W. R. Friedel. In describing his system or method Mr. Friedel says the moulding compensates for all expansion and contraction which might occur in the panel proper, as well as providing a combined frame material and moulding that permits of a practical and attractive installation of the panel material.

The corner block No. 4 is used primarily with the locking strip No. 3. The use of this block permits the moulding or locking strip to be cut square and butted against the block, doing away with the mitred joint which would otherwise have to be made. The plainer locking strip No. 5 can be used with the block or a square joint made without the corner block, if desired.

The panel material is secured by the locking strip, with a friction contact only. The panels are cut to an approximate size and laid on the flange of the rail or mullion and not nailed. The width and thickness of the No. 1 and No. 2 may be varied to suit the work in hand. That being the case, a variation of No. 1 is adaptable to such material as door and window casings, base-boards, wainscot cap and similar lines. The contour of the outer edge of No. 3 may be varied and the face of No. 1 moulded if required. The design



Details of Friedel panel mouldings and corner blocks.

could also be varied for use in office partitions or elsewhere, where a single panel is used and both sides of the work is exposed to view.

Ideal for Window Decorations

In window displays the moulding readily allows for installing and removing the panel. Thus the panel could be taken out for refinishing or decorating. Some such construction for the panel work in windows would permit of frequent changes of background, as a number of sets of panels could be used and these painted or decorated to suit the displays about to be made.

Mr. Friedel suggests that the use of his moulding should tend to increase the sale of plywood for building and decorative purposes as it provides for a practical and easy installation, giving results that are attractive and at the same time probably cheaper than could be secured by any other means. The field is a promising one but it awaits development. This must be undertaken by those interested both individually and collectively.

Now that mahogany and other hardwoods are so dear it pays to build up newels and similar sized articles with a core of soft and commoner wood. To make a good job requires first-class workmanship.

Core and Crossbanding Construction

One Species of Wood in Core—Results in Faulty Work—Why Glue is Forced Through Face Stock

By Rich. Newbecker

The fact that the core body and crossbanding of a veneered panel is its very foundation and that the future success of the veneered product depends very much upon the factor of proper core and crossbanding, in fact just as much as on the proper application of the glue and face veneers, is seldom given the consideration that it deserves. In many plants, and this in some of the largest ones which turn out quantities of veneered stock, the idea is common that the cores represent just so much material which will eventually be covered up with the face veneers, and thus all defects or poor workmanship will be hidden.

Of course it is only natural that plants using considerable quantities of ⅛ in. veneers for faces, such as for door work, and three-ply panel construction,

Using different woods in core makes uneven surface.

will accumulate quantities of veneers, not fit for facing that may be worked up for center cores. This is a very good practice, saving as it does the purchase of stock for this purpose, that is, providing it is done in the proper manner.

Keep Woods Separate

In this connection I will cite an instance which occurred some time ago in a plant making a specialty of turning out veneered doors and panels. Their veneer requirements were purchased, both in dimension sizes and log run. The intention being to use the veneer not fit for face work, in the center stock for their three-ply panels. Now if oak veneers, or any other kind of one species had been used exclusively, all might have gone right, but as these doors and panels were made of some ten different native woods, and that all defective veneers were placed together in a scrap pile and then cut up into the desired dimensions for center stock, it made a difference as far as proper panel construction was concerned.

In cutting up the center stock, no attention whatever was paid to keeping the different species of wood by itself, with the result that often three or four different kinds of wood were used for center stock in the same panel. The stock all being ⅛ in. rotary cut veneer, no trouble whatever was anticipated from its use. After several hundred doors had been completed and about ready to be shipped, someone discovered a somewhat wavy or uneven appearance in the same, and as this varied in some doors from one wave or indention to three or four in others, while a small number were entirely free of this defect, "the powers that be" were at a loss to place the blame for these results.

What Examination Showed

After due consideration it was decided to take the panels out of one door and pull them apart to ascertain the reason for this uneven appearance of the panels. A door was selected which had two depressions in the panel, and same was examined. It was found that the center stock of the panel had been constructed, as shown in the accompanying illustration, with oak, gum and ash, all used together in the same core.

These panels had all received the proper treatment of drying and sanding, and this defect had not become apparent until later. In calipering up the thickness of the ⅛ cut oak veneer, it was found to be cut slightly heavier than the gum. The gum veneer being more absorbent to moisture, had taken in more glue moisture than the oak pieces, which resulted in a larger swelling. When panels were sanded, they were cut smooth. Finally after panels were placed in door and had plenty of time to dry out, the gum pieces of center stock shrank back to their original thickness, and as panels had been sanded, it made the face veneer that much thinner in these spots, with the result that depressions could be observed across the panels at certain intervals, which spoiled the beauty and appearance of the entire door, especially after the same had been hung and varnished.

Apply Glue to Core

In building up panels of three-ply construction, different methods are followed. In some plants the glue is applied to the veneers, while others apply it to the center stock. It is true applying it to the center stock may swell the same before pressure is applied, resulting in overlapping of joints if the material is not taped. Nevertheless to the writer's mind this is the best way after all, especially if proper care is exercised in the glueing operation. In many plants tape is used to hold the separate pieces together so as to make one unit. This practice is only advisable when the tape is placed across the ends where it will be ripped off in trimming to size. Tape should never be left under the face veneer, no matter how good it seems to stick to stock, for sooner or later the paper may separate, resulting in the panel blistering.

Another method of laying center stock is by the use of tacks in place of tape. A small upholstering tack, similar to the carpet tack, is used, only it is about one-half the size of the carpet tack, being about 3/16 inches long. In glueing up panels in which ⅛ inch thick or ¼ inch thick center or core stock is used, these can be used with safety for holding the center stock in position to prevent slipping or overlapping. In using tacks on the center stock, be sure and use them near the edges of each joint. In this way the swelling will be forced away from the tack and prevent the crowding or buckling of the joints before the same gets under pressure.

Why Glue Comes Through

In using the thinner and finer grades of veneer, for face work, such as 1/20 or thinner, mahogany or walnut, trouble is often experienced with the glue coming through and spoiling much of the fine figure in the same. Some veneer men mount these veneers on paper to prevent this trouble. This, however, is not to be recommended on account of the liability of blistering. You may, have wondered why the glue penetrates through some faces and not through others. Well, the secret of this is not in the glue nor

in the face veneers. Much of this trouble can be obviated if proper attention be paid to the core and crossbanding. If you use crossbanding that is of harder or denser structure than the face veneers you are bound to have trobule with the glue coming through the veneers. The face veneer being of softer texture wood, will be more receptive to the glue moisture than the harder crossbanding, and will, consequently, absorb more and become filled up. resulting in the faces becoming glue-soaked and glue coming through.

The remedy is obvious. Make a practice of only using crossbanding of a more absorbent or softer textured wood than the veneers you are about to use. For instance with such a combination as basswood crossbanding with mahogany veneers, in place of maple crossbanding with the same veneers, much of the trouble from glue coming through the face veneers will be obviated. Attention paid to these minor details will often increase the quality of your veneered product to a greater extent than what you may think as impossible of accomplishment.

Glue Joint as Viewed Through a Microscope

Does Joint Hold Through Chemical or Mechanical Action?—Magnifying Shows Adhesive in Pores of Wood—Surfaces Appear Rough and Uneven

When glue is properly applied it holds two sheets of wood together with strength that is surprising. When good glue is used, the two sheets of veneer, or pieces of wood, can scarcely be pulled apart without tearing or breaking the wood, says a writer in "Hardwood Record." That means that the wood may not be as strong as the glue joints that unites them.

By what means does the glue secure and maintain such a grip on the wood in contact with it? Some persons suppose that a sort of chemical action takes place by which the glue and the wood are bound together somewhere as two pieces of metal are welded together by hammering while hot. Possibly something like that takes place, but it evidently is not the main binding force that fastens the wood to the glue. They are held together largely, if not wholly, by mechanical means, comparable to the nails that hold boards together, if the nails are driven through both. An examination of a glue joint under a microscope sustains the correctness of this view.

The experiment is easy to make and it reveals some interesting things. It shows quite clearly how two wood surfaces are held together by glue. A microscope of only moderate power is needed, and some experimenting may be done with the naked eye alone. The unaided eye may suffice when two coarse, rough, and very porous woods are glued together, for then the penetration of the glue into the inequalities, pores, holes, and other cavities may be observed without any magnifying.

What the Lens Reveals

The wood surface to which glue is to be applied is not an absolutely smooth one, though it may look smooth to the naked eye, or it may feel perfectly smooth to the touch, if it has been planed or sandpapered. But when it has been magnified, it is discovered to be far from perfectly smooth. Such a surface under a glass of moderate power, looks like a plowed field, with its furrows and clods.

It is well known that wood is composed of pores, cells, and groups or bundles of fibers, some hollow, some jointed, and when the surface of wood is smoothed in a planer or by a sanding belt, these microscopic elements are torn, broken, split, and some of the minute cavities are laid open, so that the surface is quite rough, although the unaided eye may not detect the roughness, and the nerves of the finger tips may not be sufficiently sensitive to feel it. However, the roughness is there, and when liquid glue is spread over such a surface and pressure is applied, the plastic substance is forced into all the holes, pits and other openings. That takes place whether the glue is applied to a cross-section of wood, as the end of a board; to the tangential section, as the side of a board, or to the radial section, as a quarter-sawed piece. These three surfaces of wood present different appearances; but all are rough when seen in magnification, all have cavities, furrows, pits, and openings, and when fluid glue is spread on any one of these surfaces, and is subjected to pressure, it is forced into all the minute openings, and there it solidifies and hardens. Every projection of the solidified glue into the openings of such a surface is like a nail, a spike, or a dovetail, with a firm hold on the wood with which it is in direct contact.

If such a joint is pried apart, it is evident that the force must be sufficient to break the little spikes of hard glue that had penetrated the openings in the wood, or the wood must be broken or split, so that slivers of it can come away, still fast to the glue.

Either result may follow an attempt to force a glue joint apart. If the glue is weak, it will break when the strain comes, and the wood surface will remain intact; but if the glue is good, it may prove stronger than the wood to which it adheres, and when the joint is pried apart, the glue will bring slivers of wood away with it.

A Magnified Glue Joint

A glue joint is easily examined under the microscope. With a sharp knife, whittle very thin shavings from the edge of a panel, so that the shavings will show the wood on both sides of the glue, and the glue between. Place a bit of this shaving under the lens in a way to exposes the edges of both sheets of wood, and the glue in contact with them. Turn on a strong light, that shines through the object, and observe what the glue joint looks like.

One of the first things noted will probably be that the two sheets of wood do not seem to be actually in contact, but are separated by a very thin sheet or membrane of glue. The next thing noted, and it will certainly attract attention, will be the rough and notched edges of the sheets of wood. Instead of presenting the appearance of straight, even lines, they will be found more like jagged rows of bent and battered saw-teeth with broken gaps here and there. These are sections of the original surfaces of the veneer sheets, for the object now being viewed is a cross-section of a panel. One look at the notched lines will make it plain that the surface of a veneer sheet lacks a lot of being perfectly smooth.

The next thing to observe, and it should prove interesting, is the glue between the two strips of wood.

To obtain the best view, a panel of some white wood should be chosen for the microscopic study, like cottonwood, basswood, or white pine; for then the contrast in color will be sharp between the wood and the glue and the interlocking of the two will be easily seen. It will be easy to note how the liquid glue penetrated the minute openings in the wood, like pegs, nails, or dove-tails, and there solidified.

Prying Joints Open

The examination may be profitably carried farther; for the microscope enables one to observe and study what takes place when a glue joint between two sheets of veneer is pried apart. Several objects must be prepared to show different stages in the process of forcing the joint open.

The peglike projections of hard glue that are held tightly in the minute openings in the wood, cannot be pulled out as the joint is forced open. They must either break off, or they will pull slivers of the wood away with them. Sometimes one thing happens, sometimes the other. As to which will happen, depends on the strength of the glue and on the kind of wood, or, perhaps, it may depend on the efficiency of the workmanship when the joint was made. It is well known that some glues are stronger than some woods, and when a joint made with materials of that kind is forced open, the glue holds, and the wood tears and breaks. But with a strong wood, like maple and birch, and with a poor glue, it is the glue that breaks, rather than the wood.

Like a Dowel or Dovetail Joint

Builders of stone bridge piers sometimes fasten blocks of stone together by dovetailing. They cut dovetails in the faces of both stones that are to be joined. The blocks are then placed in position, face to face, each dovetail opposite its mate. They are then poured full of melted lead, and when it hardens, the two blocks of stone are held firmly together, each pair of dovetails constituting a bond that must break before the stones can be pried apart.

This furnishes an apt comparison with the fastening together of two wood surfaces with glue, the natural openings in the wood answering to the dovetails cut in the stones, and the glue serving the same purpose as the lead.

Those who have experimented with wood and glue work have doubtless become thoroughly acquainted with the methods by which glue adheres to the wood; but it appears that little has been published on the subject; for users frequently puzzle over the question of just how and why glue gets a grip on wood and why and how it holds so tenaciously. The microscope shows much, but it may not show all. Possibly some chemical action occurs which increases glue's power to hold. Be that as it may, the physical bond—acting like a nail or a dovetail—is sufficient to account for most of the force by which a glue joint resists a tendency to pull the pieces apart.

Something to Be Learned Yet

Generally, glue is credited with a good joint and blamed for a bad one, and perhaps in the majority of cases, that conclusion is justified; but there must be much difference between the holding powers of different woods as well as between different glues. Suppose, for instance, that the same quality of glue is used in all cases, and is applied in exactly the same way; might not the joints behave differently, if made of different woods? If maple and chestnut were glued together, and the joint then submitted to strain until failure resulted, it might be expected that one of the woods would give way before the other. Chestnut is very coarse, and its surface is covered with large openings, while maple is fine grained, and all its pores and openings are very small. The microscope reveals a very rough surface for chestnut, a comparatively smooth one for maple. If a sheet of maple is glued to a sheet of chestnut, it might be expected that the glue would anchor much more firmly to one than to the other.

The cavities in maple are much smaller than those in chestnut, as the microscope reveals them; but those of maple may make good in number what they lack in size, and for that reason, glue may hold as well as with chestnut, or even better. In a test of strength between maple and chestnut, there can be little doubt that maple would win. Therefore, in prying apart a veneer joint, between maple and chestnut, it would be expected that more slivers of chestnut than of maple would come away.

If there is chemical union or adhesion between glue and wood, that might account for the surprising strength shown by some glue joints; but if there is no such chemical union, acting as a weld acts between metals, it is reasonable to estimate the strength of a joint on the actual amount of glue and wood to be broken when the joint is forced open, influenced, of course, by relative strength of glues and the relative strength of woods. In either case, the comparative smoothness of the wood surfaces must have much to do with it, and the microscope reveals the fact that some woods can be reduced to surfaces much smoother than others, though the smoothest lacks much of being absolutely smooth.

Plywood Manufacturers Meet

The second annual convention of the Plywood Manufacturers' Association was held in Chicago on April 12th and 13th. A gratifying number of members were in attendance. The commissioner, M. Wulpi, in his report, covered the activities of the association for 1920, and exhibited a trade barometer report for the past year which made a very interesting study, giving, as it did, a concise view of the actual conditions which prevailed during the past season.

At the present moment conditions in the plywood industry show a slight upward trend. Some of the questions, which are under consideration, include traffic classification and rates, traffic matters, national publicity, standard grade rules, the standardization of glue and the preparation of a cost instruction book.

G. O. Worland, chairman of the publicity committee, made an extensive report of the progress made in organizing the National Publicity Campaign which is to be undertaken.

The following officials were elected for the ensuing year: President, T. D. Perry, Grand Rapids; first vice-president, C. B. Allen, Memphis; second vice-president, F. B. Ward, Bay City, Mich.; third vice-president, L. H. Sergent, Marshfield, Wis.; treasurer, E. W. Benjamin, Cadillac, Mich. The above officials, together with E. V. Knight, of New Albany, Ind., and O. G. Stainer, St. Louis, Mo., constitute the executive committee.

The next meeting of the association is to be held in Chicago some time during June.

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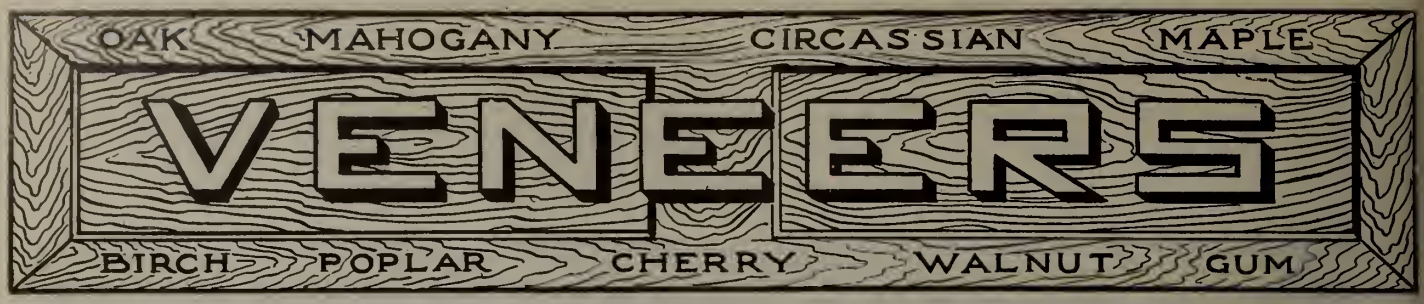

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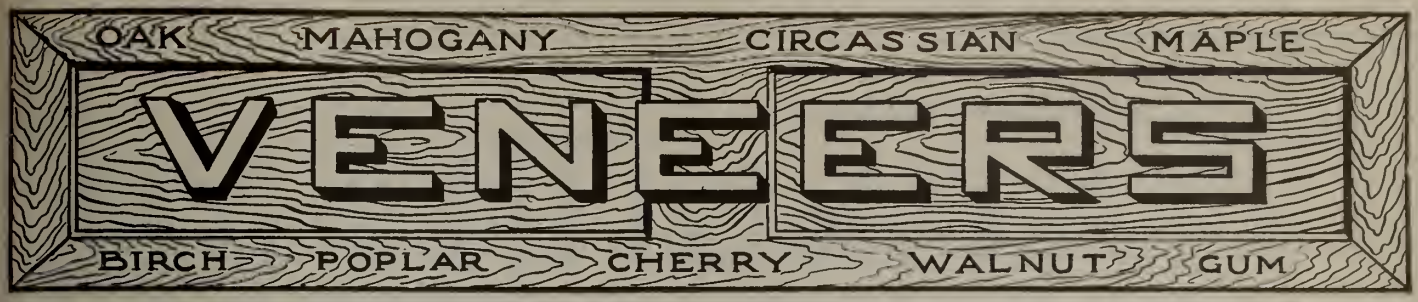

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FAS—6-9¾" Wide, 8-16" Long

3/8"	3,750 Feet
1/2"	21,470 "
5/8"	44,140 "
3/4"	25,962 "
4/4"	82,502 "
5/4"	26,766 "
6/4"	39,201 "
8/4"	33,140 "
10/4"	14,245 "
12/4"	11,470 "
16/4"	3,700 "

FAS—10" and Up Wide, 8-16" Long

1/2"	9,680 Feet
5/8"	18,980 "
3/4"	14,430 "
4/4"	48,872 "
5/4"	14,165 "
6/4"	10,262 "
8/4"	16,920 "
10/4"	10,250 "
12/4"	1,800 "
16/4"	2,100 "

Fas—6"and Up Wide, 6-7 Feet Long

3/8"	1,200 Feet
1/2"	5,790 "
5/8"	840 "
3/4"	8,940 "
4/4"	32,400 "
5/4"	2,300 "
6/4"	7,800 "
8/4"	1,500 "
10/4"	1,400 "
12/4"	500 "
16/4"	400 "

SELECTS

4/4"	32,940 Feet
5/4"	27,530 "
6/4"	21,480 "
8/4"	33,590 "
10/4"	16,850 "
12/4"	6,054 "
16/4"	1,332 "

NO. 1 COMMON

3/8"	8,000 Feet
1/2"	27,380 "
5/8"	29,850 "
3/4"	31,285 "
4/4"	59,675 "
5/4"	38,240 "
6/4"	18,750 "
8/4"	39,240 "
10/4"	16,363 "
12/4"	4,768 "
16/4"	1,604 "

NO. 2 COMMON

3/8"	1,500 Feet
1/2"	1,900 "
5/8"	4,500 "
3/4"	2,190 "
4/4"	72,250 "
5/4"	47,890 "
6/4"	31,720 "
8/4"	35,940 "
10/4"	19,140 "
12/4"	20,116 "
16/4"	16,088 "

Write for prices on any items you are interested in *"PENROD SERVICE" Satisfies*

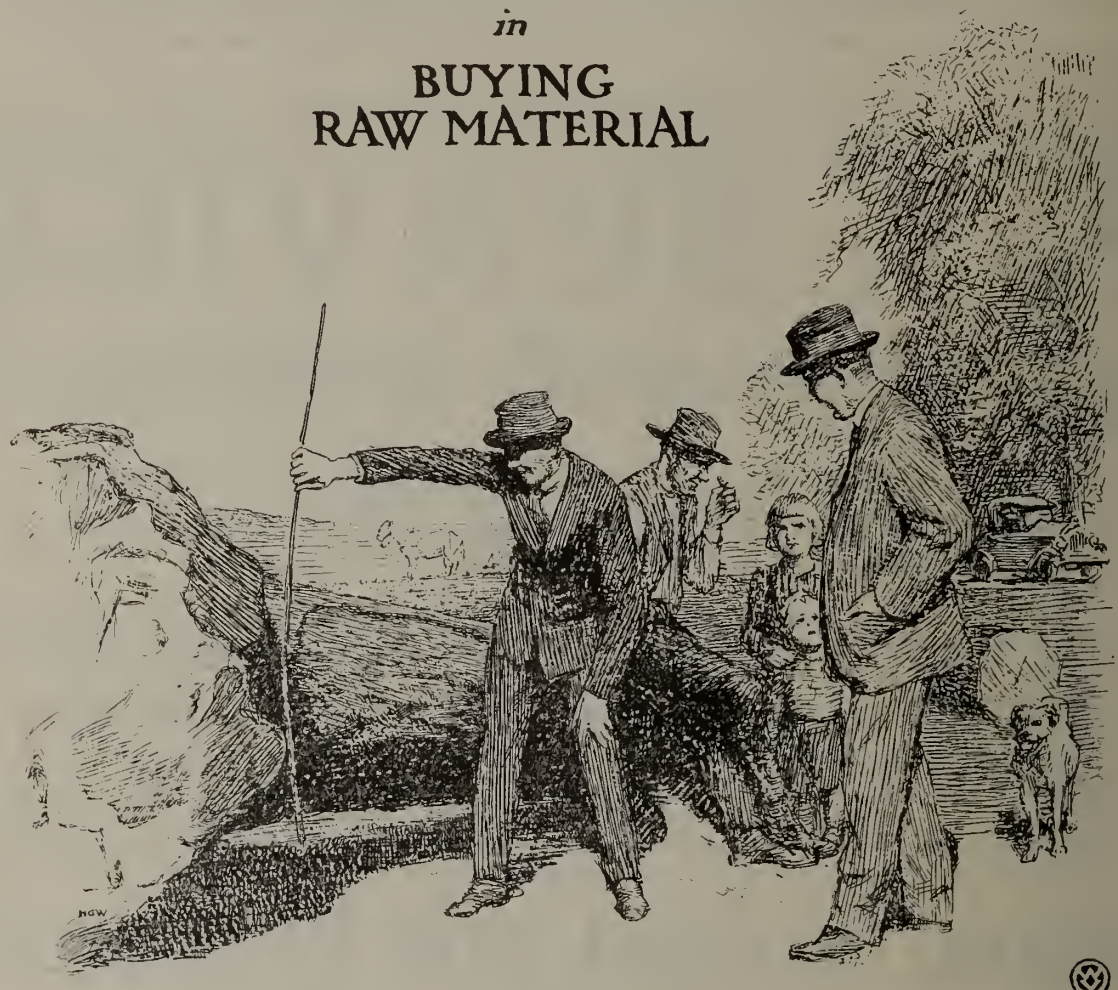
C. A. Rugg, 115 Foots Avenue, Jamestown, N. Y., Eastern Representative.

Geo. C. Hall, 610 South Michigan St., Representative for Chicago and Michigan territory.

CAPABILITY

in

BUYING RAW MATERIAL



Our logs are selected solely for veneer purposes.

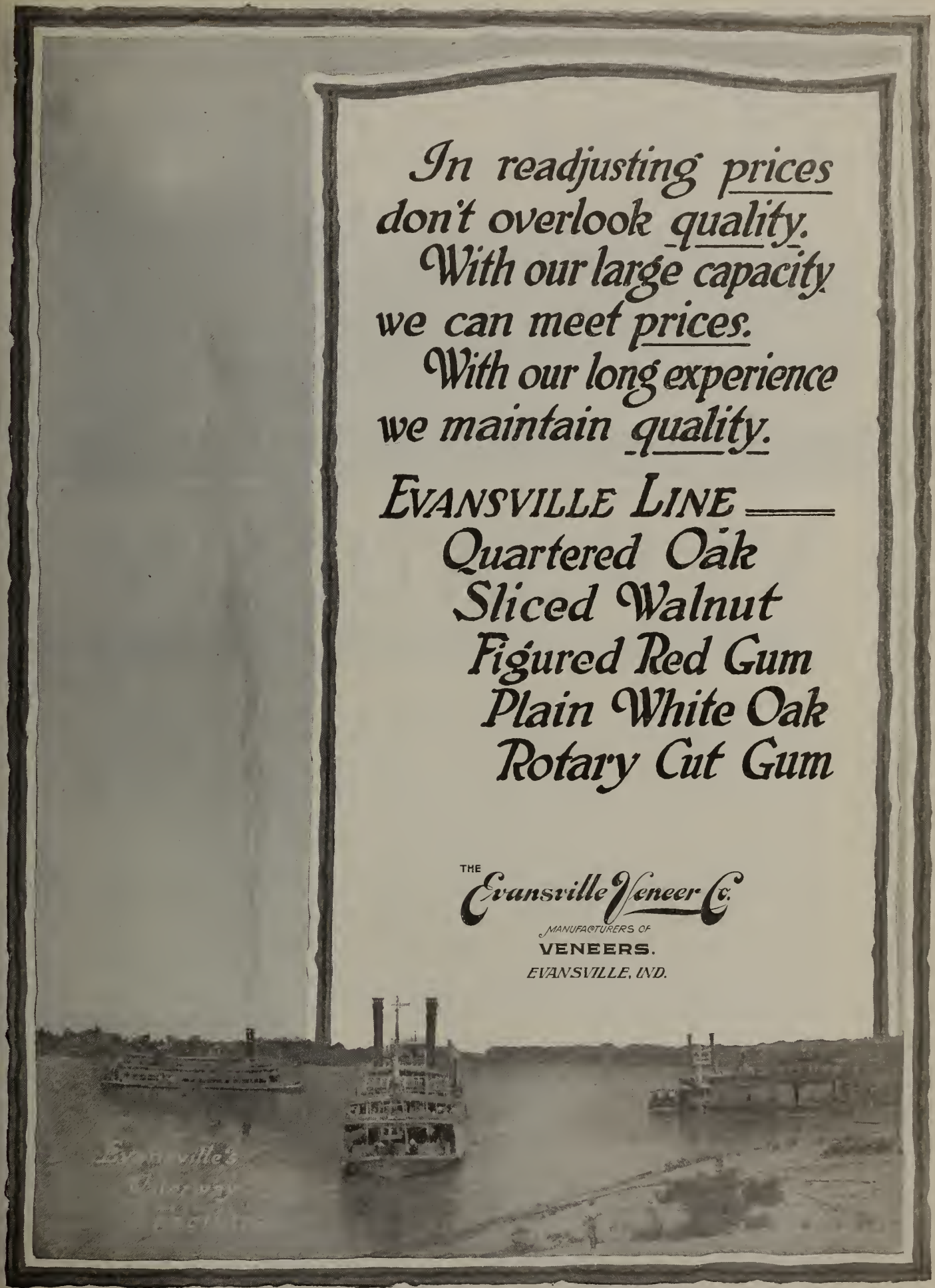
WALNUT BUTTS • LONG WALNUT • MAHOGANY • BURLS • OAK • POPLAR ETC.

"RIGHT VENEERS AT RIGHT PRICES"

THE WILLIAMSON VENEER CO

MILLS - BALTIMORE, MD., SALES BRANCHES AS FOLLOWS:

NEW YORK - 709 SIXTH AVE. • HIGH POINT • JAMESTOWN • 28 E. JACKSON BOULEVARD CHICAGO


In readjusting prices
don't overlook quality.
With our large capacity
we can meet prices.
With our long experience
we maintain quality.
EVANSVILLE LINE
Quartered Oak
Sliced Walnut
Figured Red Gum
Plain White Oak
Rotary Cut Gum
THE
Evansville Veneer Co.
MANUFACTURERS OF
VENEERS.
EVANSVILLE, IND.

·VERSATILITY·

The Keynote to Operating Efficiency

Versatility of manufacturing requires a complete assortment of manufacturing facilities and a supply of varied raw materials, all of high character. Our long successful record has been developed on a plan which aimed at an organization which could fill any and all requirements for high grade hardwood materials. That versatile organization maintains contact with a tremendous supply of splendid timber and incorporates four band mills and three veneer mills, each designed for the manufacture of a specific product. The result is the best obtainable in quartered and plain white oak lumber, sawed quartered oak veneers, walnut lumber and sliced and rotary cut walnut veneers, rotary cut yellow poplar crossbanding and a general line of high grade hardwoods—an offering and a service that warrants your inquiries.

WOOD-MOSAIC COMPANY

Chicago Representative
GEO. W. STONEMAN & CO.
845 Erie St.

Incorporated
Louisville, Kentucky

Grand Rapids Representative
HECTOR ROBERTSON
232 Lyon St., N.W.

ALGOMA *the Better* Plywood

"For want of a nail . . . . the horse was lost"

Many a retail sale falls through because the graining and the finish of the top or panels do not appeal to the customer's taste. Many a customer has become dissatisfied because the plywood used in his purchase did not stand up under use. He does not blame the maker of the plywood, he blames your dealer and you.

Therefore, it is important to check up on your panels and plywood. Be sure that the manufacturer who supplies you works by such standards as those which produced Algoma, the better Plywood. For thirty-five years we have been building plywood that does have the surface and graining which give greater quality to the finished product.

To give Algoma Plywood its permanence of form, throughout our factory care is used in every process. Test one order of Algoma, the Better Plywood, by actual use, and you'll standardize on this plywood for every job.

. . .

Did you ever consider how much depends on your choice of Plywood?

ALGOMA PANEL COMPANY, *Algoma, Wis.*

Getting Results With Scrolls and Curves

Veneering of Curved Surfaces Presents Problems—Suggestions for Simplifying Work—Band Sawyer Plays Important Part

One of the most difficult operations the veneer man has to do is veneering irregular shapes. Some of these are of such a shape that it is almost impossible to be sure of a first-class job. Many designers are very considerate of this difficulty and give it special attention, while others, a small minority I am glad to say, seem to have the idea that anything that can be drawn with a pencil can be veneered. Of course, such men have never had any practical experience and have no business attempting to design furniture. The trouble with such men is they do not want to learn, for if one suggests a change in shape, or even in the specification, in order to eliminate some difficulty, or reduce the cost of construction, they always have a lot of theories to advance as to why, in their opinion, it cannot be done in the way suggested.

The most difficult thing the veener man has to accomplish is that of an even pressure at all points. The same high pressure that is required on flat work is not necessary to success in veneering these irregular shapes, but it is exceedingly important that there be a reasonable pressure at all points, and in making these designs and preparing specifications the designer should give first consideration to the practical side of production and the expense involved. If the veneer man cannot get pressure sufficient to make a permanent job because of faulty design or specification, the whole thing is a failure, no matter how it may look on paper.

Securing Uniform Pressure

A great deal of this irregular work is band sawed, and unless the band sawyer is one who thoroughly understands his business, his work may give the veneer man trouble. It frequently happens that in veneering scrolls the part that is cut away at the band saw to make the scroll is used as a caul, or form, to press the veneer into shape. This is the best way to make the veneer conform to the shape, but if the band sawyer will first ascertain the thickness of the veneer to be used, and use a saw that will make a cut the same thickness as the veneer, so that the veneer will simply fill in the space cut out by the saw, he will eliminate much of the difficulty which one would otherwise have in getting uniform pressure. To illustrate why this is so, take and saw a scroll and lay the two pieces together, and you will see that they touch at some points, while at other points they are open, or separated. Now, if the wood that had been cut away could be gathered up and placed in its old position, it would bring all these points an equal distance apart again, the same as they were before the cut was taken away. We cannot get that same wood back again, but a piece of veneer the same thickness should answer the same purpose. Now, if the saw kerf is 1/16 in. wide and we fill that space with a 1/16 in. veneer, we have practically the same condition as obtained before the scroll was cut, and if we put it in the press we will have uniform pressure as all points touch alike. But should the veneer be thinner or thicker than the saw with which the scroll was cut, some points will touch and others will not, with the result that some points will receive little or no pressure, while others will receive more than they require.

In making sharp curves with a band saw it is necessary to use a narrow blade in order to confine the width of the kerf to the thickness of the veneer to be used. In doing work of this kind one should have his machine in the best possible condition, to keep his saw from going astray, for the slightest wandering at this time will make it pretty hard for the veneer man to do his work in a satisfactory way.

The veneer man must also know his business for, no matter how well the work of designing and cutting scrolls may be done, if the veneer man does not understand the principles of applying pressure on work of this kind, he will not get it uniform. It is seldom that on work of this kind the pressure can be applied to one point at a time, and it should be applied gradually. It is possible to so apply the pressure to one part of a scroll that little or no pressure can be obtained at another point. Watch the pressure closely and apply it a little at a time at each point—not all at one point first, and then try to get it all on at another point. I have seen work crushed beyond recovery in an effort to obtain pressure at a point that could easily have been reached had the pressure been relaxed at another point; then all could have been tightened up together. Pressure frequently has to be applied from different directions, and one must study his scroll to learn where to start the pressure. As we said before, it does not take a great deal of pressure to do good work on small surfaces like scrolls,

J. W. Frye Lumber and Veneer Co.
Dayton - Ohio
Manufacturers and Wholesalers
Specialize in
Walnut Lumber and Veneers
Oak Lumber and Veneers
Also All Native Hardwoods
Guarantee all stocks to be Ohio and Indiana grown

VENEERS

The Quality Kind

We carry in stock, for immediate shipment, 3 and 5 ply Panels in Birch, Oak, and Mahogany — sizes 24" and 30" wide, 48", 60" and 72" long.

A complete range of American Walnut, Quartered Oak, Mahogany, Figured Gum Veneers and Rotary Cut Veneers.

It is not uncommon that a really fine piece of furniture has been practically ruined after a few months service because of the poor grade of veneer used. Such happenings do much to harm the manufacturer's reputation. That is why many will not consider anything but the best—usually they insist on Toronto Veneers—the quality kind.

Toronto Veneer Co., Ltd.

1100-1104 Queen St. West, TORONTO, ONT

Walnut, Quartered White Oak and Mahogany Veneers and Lumber

Prompt Delivery

LONG-KNIGHT LUMBER COMPANY

INDIANAPOLIS, IND.

Information and Inquiries

You are cordially invited to make use of this department

Filling for Open Joints

Windsor, N.S., April 27, 1921.

Editor, Canadian Woodworker:

Tops of bureaus, commodes, buffets, etc., made of birch, beech and similar woods and jointed on a Linderman machine, show a strong tendency to open up, a few days after being glued. This often happens when the articles are being finished or even when completed and awaiting shipment. I would like to know if you can suggest any preparation or filler that could be applied to the open joints and which would make a permanent job. Thanking you for a prompt reply.

Sincerely yours,
R. D. Green.

There are a number of preparations which might be used to fill the cracks appearing in the ends of your bureau and dresser tops but this trouble is one which is very hard to remedy.

These cracks appear because the stock used in the tops is not thoroughly dry. Naturally the ends would dry quicker than the body of the top and as a result shrink faster. Something is bound to open up, and as a rule it is the joints which give way. The real remedy is to see that the stock is thoroughly dry when glued up and that in subsequent operations it is not given an opportunity to absorb moisture.

Many firms, when they find the tops of stock opening up, remove the tops, dry the stock and make new joints, then re-finish again. If these cracks are not very wide, it is possible that you might be able to fill them with stick shellac. This material can be secured from manufacturers of finishing material and comes in different shades to match all finishes. By securing a shade that would blend in with the surface oak finish, you might be able to melt this shellac into the crack and thus overcome the trouble. One drawback is that if the top has not dried out before these cracks are filled, they will likely open a little more and you will find it necessary to do the work over again.

The Perkins Glue Co. of Lansdale, Penn., manufacture a material which they call "Quick Repair." This is for filling splits, checks and other defects in face veneers. It is made in different colors to suit all finishes. We are under the impression that this must be used before the stock is finishd, but would suggest that you put your problem up to them to see what they have to say.

Kapok Wanted

Hamilton, April 19, 1921.

Editor, Canadian Woodworker:

Can you tell me where I can buy some Kapok for filling mattresses and cushions.

Yours truly,
John Leverington.

Kapok may be secured, either by the bale or in larger quantities, from any of the following firms: Gold Medal Furniture Mfg. Co., Toronto; Whitworth & Restall, Toronto, or the Canadian Feather & Mattress Co., Toronto.

Enquiry for Yard Sticks

Montreal, May 7, 1921

Editor, Canadian Woodworker.

We have received an enquiry for a large quantity of maple yard sticks for advertising purposes. These yard sticks must be made of maple wood, have a certain amount of printing or stamping matter on both sides of them, and our clients essentially stipulate that these yard sticks must be made in Canada. Can you give us the name of any firm in Canada which is equipped to handle this business.

Yours truly,
Alexander, Furniss & Co.

We do not know of any company in Canada making yard sticks. H. E. Hunt, Toronto, has installed machinery for making 12 in. and 15 in. rulers and may be able to handle yard sticks. If there is any difficulty in having the stamping or printing done, could not transfers be used instead?

Rush for Chair Seats

Victoria, B.C., April 22, 1921.

Editor, Canadian Woodworker:

Do you happen to know where I could procure, in Canada, rush seats for chairs? Or, in the event of not being able to get them made up, where could I get the rushes suitable for this purpose? Thanking you in anticipation, I am,

Yours truly,
H. L. Johnson.

If any of our readers can supply this information we will be glad to forward it. Here is a chance for a little real co-operation.

Chairs Wanted

One of the largest firms of commission agents in Trinidad, with branch offices in Demerara and Barbados, would like to represent a Canadian firm manufacturing a cheap grade of upright chairs, both with wooden and cane seats, and also rocking chairs. If prices are right, a large business can be guaranteed. Inquiry No. 2920.

Early English Finish

Southampton, Ont., May 6, 1921.

Editor, Canadian Woodworker:

Replying to the enquiry in the April issue of your paper, I will outline how I secure the early English finish. Cut 1 lb. of No. 555 Lockwood Early English powder with one pint of benzoil, then add enough benzine to make 2 gallons of stain. Brush on the wood evenly and then after it is dry, say 12 hours, give a coat of white shellac, cut 1 lb. to a gallon of spirits. After the shellac has dried fill with a black filler, when shellac again, then varnish and rub with oil and pumice after varnish has stood for four days. Regular golden oak filler with "drop black" added makes a good filler.

Sincerely yours,
C. H. Green.

It is wonderful how long some British-made sawing and moulding machines will run without requiring any repairs.

LELAND G. BANNING

CINCINNATI, OHIO

Our Specialty:

SOFT OAK PLAIN AND QUARTERED

also **MOUNTAIN POPLAR**
WALNUT, ASH, CHESTNUT
OTHER HARDWOODS

Canadian Representative:
A. E. KLIPPERT,
11 LAXTON AVE.,
TORONTO, ONT.

BAND MILL:
FRANKFORT, KY.

1897 1853 1921

Veneered Panels

Ready for quick shipment in following veneers

Walnut, Plain Oak, Birch, Quartered Oak, Mahogany, and Maple.

3 Ply—1/4" thick and 5 Ply—3/8" thick.
Sizes—72 x 24, 60 x 30, 60 x 24, 56 x 25, 60 x 20, 60 x 18, 48 x 18.
also in quantities cut to size for
PHONOGRAPH CABINETS, FURNITURE DRAWER BOTTOMS, ETC.

Hay & Co., Ltd.

Woodstock, Ontario

Is Opportune Time to Buy Lumber Passing?

Reports Indicate Prices Stiffening—Better Grades Exceedingly Scarce—Production Further Curtailed—Shortage in Certain Lines Probable

Judging from reports received from the various lumber manufacturing centres, especially those producing oak and gum, it would appear as if there has been a decided change in the lumber situation during the past few weeks. This change cannot be attributed to any unexpected improvement in demand, although buying is on the increase, but more to a combination of causes.

Many operators and buyers are convinced that the lowest point has been reached and that conditions in the lumber industry are due to improve. This conviction is borne out by the fact that the demand for stock is slowly but none the less surely increasing. It is not anticipated that things will come back with a rush, were they to, prices would shoot upward, but rather that there will be a slow, steady movement toward stabilization and good, sound business.

Shortage of Upper Stock

There are a number of other influencing factors. One is that there is an undoubted shortage of upper grade lumber, and this condition will become more marked as buying continues. F. A. S. and No. 1 and 2 commons are becoming increasingly scarce and hard to secure. This condition is, as would be expected, being reflected in prices, which have advanced on many items in these grades. It will not be long before this shortage of high-grade material will affect the grades immediately below. When a buyer cannot secure the stock he wants, or is accustomed to buying, he takes the next best grade. For this reason it is thought likely that the shortage of upper grades, with its tendency toward higher values, will gradually be noticeable in connection with all lower stock.

Now a word about production. It is a well-known fact that many mills are closed and that production is at a very low point. This condition is being further aggravated because many of those that have continued cutting are closing or planning to close. Many of these mills remained in operation with the sole object of cutting the accumulation of logs they had in their yards and in the woods. As these logs are worked up, the mills are closing down.

Production Will Continue Low

It will be some time before these mills can resume cutting even though the market should show a rapid improvement. First it would be necessary to start the woods operations and assure a steady supply of logs. This cannot be done in a day or a week. The resumption of logging operations is out of the question at the present time owing to a prolonged spell of wet weather which has made conditions in many of the logging areas such that it would be next to impossible to put a crew in and commence bringing out logs inside of six weeks or two months. Thus it will be seen that there is little to be expected from the production end. As far as the Southern producing centres are concerned, it is predicted that all the stock which will be cut this year, will be on the sticks by the end of June.

The few mills that are operating can offer but little hope of relief, that is as far as the better-grade material is concerned. The logs on which they have been working for the past few months and those which remain to be sawn, were cut last season and have been lying in the woods, along roads, at railway sidings and stored in the mill yards, for long periods, with the result that they have deteriorated to such an extent that they contain little, if any, high-grade lumber, so that the material which is being manufactured to-day is principally low-grade stock. In view of this it is difficult to see how the depleted and broken stocks of uppers can be replenished before fall or even before the new year.

Apply in Other Fields

It is expected that similar conditions will gradually extend to other centres. In the northern field, cutting birch, beech, maple, etc., production is being curtailed still further. The manufacturers of these goods will not go on producing when they cannot secure cost from the material. There has not been any noticeable increase in demand in this section but it is felt that buying will shortly show an improvemennt. According to statistics covering the month of April, production in Michigan woods was one-third less than orders received.

In the Canadian hardwood centres stocks are none too plentiful, especially in the better grades, and production is low. Many of the small manufacturers, who in the past were responsible for the bulk of the cut in Ontario and Quebec, are finding it difficult to finance their operations this season. Formerly they were accustomed to lean on the bank but owing to general conditions, the banks are not as free with their credit as formerly. This can have but one result, namely, that production is bound to be considerably below normal. Other factors are not hard to find which have tended to have the same effect—lower production. As confidence returns and buying becomes easier, it can lead to but one condition, one that is not favorable for the buyer and user of lumber, and that is a shortage in many lines coupled with stiffening prices.

If this improvement in demand has already set in, and many claim that they see indications which show that the tide has turned, it would appear as if the most favorable time to sort up stock and cover for the next few months is rapidly passing. Lumber cannot go lower, the next movement is upward. Has that movement begun?

Good Price for Sawdust

One woodworker, who manufactures a product calling for a large quantity of thin hardwood strips, reports that he is able to dispose of the sawdust produced at a price that pays nearly 50% of the lumber bill. In this particular instance the sawdust is used by several fur-cleaning establishments and to secure the desired quality and grade this woodworker files his saws in a special manner and then sifts the sawdust. The price secured is in the neighborhood of $1.00 per bag. This only goes to show that a market can be found for sawdust, and shavings too, if one will but look for it.

Canadian Hardwoods

Good Stocks
Right Grades
Prompt Shipments

:: Members National Hardwood Lumber Association ::

Crating
of all descriptions

C. A. Spencer, Limited
Merchants and Manufacturers
McGILL BUILDING - MONTREAL

THE
GALL LUMBER CO.
Limited

Established 1875

HARDWOOD LUMBER

MAHOGANY, WALNUT

Office, Yards and
Service Dry Kilns
Foot of Spadina Avenue
TORONTO, CANADA

We are carrying a large and well selected stock of

Dry Canadian Hardwoods

consisting of

4/4" & 6/4" Brown Ash
4/4" & 8/4" White Ash
4/4", 5/4" & 6/4" Basswood
4/4", 6/4", 8/4" & 12/4" Birch
4/4", 8/4" & 12/4" Hard Maple
4/4", 8/4" & 12/4" Oak
4/4", 8/4" & 12/4" Soft Elm

May we have the pleasure of quoting on your requirements?

Canadian General Lumber Company, Limited
712 Bank of Hamilton Bldg.
TORONTO
MONTREAL OFFICE: 203 McGill Bldg.

Selling
Graves, Bigwood & Co.'s
Lumber, Lath and Box Shooks

News of the Trade

McCulloch Bros., Debert, N.S., contemplates erecting a woodworking plant at a cost of $10.000.

The plant of the Royal Bedding Co. of Toronto was damaged to the extent of $1,000 by fire recently.

The Eburne Sash & Door Co., Marpole, B.C., has been recently organized with C. R. Whitley and V. J. Winkel as partners.

M. A. Bradshaw, 1483 Chateaubriand St., Montreal, has commenced work on a new box factory, the building to be 50 x 42, 2 storeys high.

The plant of the Ontario Case & Store Fixture Co., Queen St., Toronto, was recently visited by fire. The damage amount to about $2,500.

The 24th annual convention of the National Hardwood Lumber Manufacturers' Association is to be held in Philadelphia June 9th and 10th.

Sturgis Baby Carriage Company Limited, Toronto, have been authorized by supplementary letters patent to increase their capital from $40,000 to the sum of $250,000.

The H. E. Furniture Company, Limited, Milverton, Ont., have been authorized by supplementary letters patent, to increase their capital from $40,000 to the sum of $150,000.

The Great West Mfg. Co., Limited, Vancouver, B.C., is producing a line of sectional houses for the prairie trade. These are made in sizes of 20 x 24, 22 x 24, 24 x 24. S. Brereton is the manager.

The Memorial Shops were recently opened on Water St., St. John, N. B. This is being promoted by a number of returned men who propose making furniture to order and doing light jobbing of all kinds.

The Riddell Carriage and Motor Works, Limited, Saskatoon, Sask., were recently granted a provincial charter to manufacture and deal in carriages, automobiles, and other wooden vehicles. Capital $100,000.

Lundy Products, Limtied, Toronto, was recently granted a provincial charter to manufacture and deal in all kinds of washing machines. Capital $40,000. A. R. Lundy and Beatty Douglas, both of Toronto, are two of the incorporators.

Plans are being prepared by the Conklin Planing Mill Co., Kingsville, Ont., for a new planing mill and office to cost approximately $25,000. W. T. Conklin, the proprietor, expects construction to be under way early this summer.

The third annual convention of the National Association of Wood Turners, Incorporated, and Affiliated Associations will be held at Hotel Washington, Washington, D.C., on Wednesday, Thursday and Friday, June 8th, 9th and 10th.

The Speaker's chair, which was illustrated in the April "Canadian Woodworker," was formerly presented to the House of Commons on Friday, May 20th. Former Speaker Lowther, of the British House of Commons, made the presentation.

The Glass Casket Company, Limited, Montreal, were recently incorporated to manufacture and deal in glass and other kinds of burial caskets. Capital $2,000,000. Among the incorporators are G. McTeigue and R. Brodeur, both of Montreal.

Dominion Bedstead Company, Limited, Montreal, has been incorporated to manufacture and deal in beds, furniture and upholstered products. Capital $250,000. H. Weinfield and M. M. Sperber, both of Montreal, are two of the incorporators.

Scythes Vocalion Co., Limited, Toronto, were recently incorporated to manufacture and deal in all kinds of musical instruments. Capital $200,000. W. Zimmerman and W. H. Osborne, barristers, both of Toronto, are two of the incorporators.

Mack Trucks of Canada, Limited, Toronto, have been incorporated to manufacture and deal in motor trucks, automobiles and other wooden vehicles. Capital $50,000. W. W. Perry and C. C. Legott, both of Toronto, are two of the incorporators.

The Community Builders, Limited, Toronto, were recently incorporated to carry on business as contractors and manufacturers of and dealers in building material; capital $500,000. H. D. Johnston and H. B. Taber, both of Toronto, are among the incorporators. These same gentlemen are among the provisional directors of another newly organized association known as the Toronto Home Builders' Association. This organization has been incorporated to promote all kinds of building and to protect those engaged in the construction industry.

Hoffman & Company, Limited, Montreal, were recently granted a provincial charter to manufacture and deal in cigar boxes and other wooden containers. Capital $50,000. Two of the incorporators are F. Hoffman and H. A. Bermigaud, manufacturers, both of Montreal.

Reports received from Vancouver indicate that heavy shipments of box shooks are being made on nearly every boat leaving that port for the Orient, Singapore and Australia. A considerable volume of business is also being secured from some of the Mediterranean states.

Waltham Motors Corporation, of Canada, Limited, Toronto, has been incorporated to manufacture and deal in automobiles, trucks, carriages and other vehicles. Capital $1,000,000. Among the incorporators are M. C. van der Voort and John Gallivan, both of Toronto.

Campagnie d'Importation du Canada, Limitec, Montreal, were recently granted a federal charter to manufacture and deal in furniture, toys, picture frames and wooden products. Capital $125,000. Two of the incorporators are J. B. Fortin and R. A. Perrault, both of Montreal.

Kasement Skrene Dore Company, Limited, Toronto, was recently granted a provincial charter to manufacture and deal in doors, sashes, screens and other wood products. Capital $50,000. W. H. Cunningham and W. F. Hill, both of Toronto, are two of the incorporators.

Waterloo Bedding Company, Limited, Waterloo, Ont., were recently incorporated to manufacture and deal in beds, bedding equipment and upholstered products. Capital $200,000. M. H. Montag and A. L. Dantzer, manufacturers, of Waterloo, are two of the incorporators.

The Acadian Phonograph Company, Limited, Toronto, was recently granted a provincial charter to manufacture and deal in phonographs, gramophones and other musical instruments. Capital $40,000. J. H. Young and L. J. Brown, both of Toronto, are two of the incorporators.

The Cooperage Company of Canada, Limited, Toronto, were recently granted a provincial charter to manufacture and deal in barrels, kegs and other wooden containers. Capital $40,000. Two of the incorporators are M. L. Gordon and I. M. Macdonell, barristers, both of Toronto.

Mayers Chalmers, Limited, Sault Ste. Marie, Ont., were recently incorporated to manufacture and deal in automobiles, trucks, boats, flying machines and other wooden products. Capital $75,000. W. H. Ewing and W. C. Mayer, both of Sault Ste. Marie, Ont., are two of the incorporators.

The T. H. Brown Company, Limited, Toronto, have been incorporated to manufacture and deal in all kinds of musical instruments and to take over the business known as T. H. Brown & Co. Capital $40,000. T. H. Brown and C. S. Ballard, both of Toronto, are two of the incorporators.

Dominion Broom & Handle Co., Limited, Mount Dennis, Ont., has been granted a provincial charter to manufacture and deal in brooms, brushes, handles and other wooden products. Capital $40,000. Two of the incorporators are H. J. Martin and C. Evans-Lewis, barristers, both of Toronto.

The McLagan Furniture Co., Limited, Stratford, Ont., recently put into effect a 10% reduction in wages and salaries. This effects the whole staff from the management down. The hours have been increased to 50 per week so that weekly pay envelopes of the workmen will be the same as formerly.

Acoustiques Phonographiques, Limited, Montreal, have ben incorporated to take over the business known as Benoit & Mathieu and to manufacture and deal in pianos, phonographs and other musical instruments. Capital $50,000. Two of the incorporators are J. L. Mathieu and A. Benoit, both of Montreal.

W. H. Cunningham & Hill, Limited, Toronto, Ont., were recently incorporated with a capital of $150,000. This new firm takes over the business now being carried on by W. H. Cunningham & Co. This firm is the Canadian representative for the Monite Waterproof Glue Co. of Chicago, manufacturers of Monite Casein Glue.

The enamelling department of the Canada Wood Specialty Co., Limited, Orillia, was recently seriously damaged by fire. The loss amounts to about $10,000. The fire is supposed to have started from the electric wiring in connection with the enamelling ovens. This was a very busy department of the plant and was handling about 40,000 pieces

Three Questions—

could you answer them?

Do you ever consult your banker—Most likely—Then suppose your banker, for instance, asked you these three questions—could you answer them? Try it!

1. *How many hours of labor do you purchase each month?*
2. *How many were productive hours?*
3. *Are the records of your purchased and productive hours printed and unchangeable.*

They may be, and probably are, pertinent questions, and on them may rest the success or failure of an organization—yours perhaps.

If you can answer these three questions by the simple reference to records that are printed and unchangeable, you have complete control over what is today the costliest item of production—labor.

International Time Recorders and International Job Time Recorders give you the answers to these vital questions any time you care to refer to them for any month, any week, any day in the year. And those records are convincing too, because they cannot be changed.

We have a time recording system that will give you accurate information on the labor costs of your factory. A short talk with one of our representatives or some of our literature may prove of great value to you. No obligation attached to either—just say which.

International Business Machines SPEED ACCURACY ECONOMY

International Business Machines Co.

LIMITED

F. E. MUTTON, Vice-President and General Manager

Head Office and Factory: 300-350 Campbell Avenue, Toronto

HALIFAX, 44 Granville St. ST. JOHN, 18 Germain St. QUEBEC, 506 Merger Bldg. MONTREAL, 1 and 3 Notre Dame St. OTTAWA, 190 Queen St. TORONTO, 409½ Yonge St. HAMILTON, Room 8, 36 James St. S. LONDON, 489 Richmond St. WALKERVILLE, 44 Lincoln Rd WINNIPEG, 227 McDermott Ave. VANCOUVER, 110 Water St. SASKATOON, 254 Third Ave. S.

Also manufacturers of International Dayton Scales and International Electric Tabulators

per day. There was about two week's supply of unfinished material in the building at the time of the blaze. Repairs will be effected as quickly as possible and it is hoped that finishing operations will be resumed in quick order.

H. E. Hunt, who operates a woodworking plant at 337 Leslie St., Toronto, is producing a line of advertising and school rulers which are equal to the best imported product. Mr. Hunt designed the special equipment which has been installed to handle these rulers. He claims to be the only manufacturer of this line in Canada.

The Eternal Battery Co. of Canada, Limited, Winnipeg, Man., which was recently organized with a capitalization of $1,000,000, have secured suitable quarters in Winnipeg and are manufacturing their line of storage batteries for automobiles, motor boats, etc. About 20 hands are employed and the present output is 30 batteries per day.

The employees of the Office Specialty Co., Newmarket, Ont., together with their wives and families, were the guests of the management at a very enjoyable concert. The programme consisted of a number of attractive moving pictures interspread with some fine musical selections. A. M. Smith, superintendent of the factory, presided.

Canadian Wood Heel & Block, Limited, Pointe-Aux-Trembles, P.Q., was recently granted a provincial charter to manufacture and deal in wooden heels, patterns and moulds, sashes and doors and other wood products. Capital $90,000. T. Desnoyers, of Pointe-Aux-Trembles, and C. Durocher, of Montreal East, are two of the incorporators.

London Woodworkers, Limited, London, Ont., were recently incorporated to take over the business known as the London Art Woodwork Company, Limited, and to manufacture and deal in interior fittings and other wooden decoration. Capital $100,000. E. R. Dennis and T. J. Murphy, both of London, Ont., are two of the incorporators .

That the high freight rates have a lot to do with present lumber values was shown by a memorandum exhibited by a large lumber manufacturer recently, in which it was shown that freight to the extent of $947.03 was paid on lumber valued at $1,142.03, leaving a balance of $195.00 for the lumber manufacturer. This is at the rate of about 5 to 1.

The Ottawa Building Trades Council has abandoned its former policy and recently came out in favor of individual bargaining. This action on the part of labor practically eliminates the chance of a general strike. Agreements will now be made by the various unions that comprise the council with individual contractors or groups of all contractors.

C. W. Young and George E. Ronson have formed a partnership to conduct a general woodworking business manufacturing store, office and church fixtures, together with store fronts, show-cases and special furniture. Both these gentlemen have had considerable experience in the woodworking business and should be able to make a success of their new venture.

"The Rid-Jid of Canada" is the name of a new company organized in Ingersoll to manufacture the "Rid-Jid" ironing board. G. C. Ellis, for many years head of the Ellis Furniture Co., and H. Swallow, formerly of the Ingersoll File Co., are the organizers. In all probability this article will be manufactured in connection with the plant of the Ellis Furniture Co., Limited.

A successful, well-attended meeting of the Furniture Manufacturers' Association was held in Toronto on Wednesday, May 18th. This was the regular semi-annual gathering. A number of important questions were discussed, including the work of the newly organized Home Furnishings Bureau. A full report of this meeting will appear in the June "Canadian Woodworker."

The Everready Mfg. Co. of Canada, Limited, has secured a factory building in Hull, P.Q., and contemplate manufacturing a line of office appliances and furniture. The parent organization of this company is located in Boston, and owing to the duties and high exchange rate, it has been found advisable to establish this Canadian branch. It is expected that about 50 hands will be employed.

The Jackson Mfg. Co. have secured a plant at Durham, Ont., and are equipping it for the manufacture of phonograph cabinets. It is understood that a contract has been secured from the Columbia Phonograph Co. and that for the present the output will be confined to "Grafonola" Cabinets. About 20 hands will be employed at the start and it is anticipated that this number will be increased to at least 50.

The installation of the equipment in the new plant of Miller & Gordon Mfg. Co., Carleton, N.S., is rapidly nearing completion. This factory is to be devoted largely to the manufacture of hardwood products in the shape of clothespins and dowels. Up-to-date labor-saving production machinery has been purchased and when the plant is complete it will be one of the finest of its kind in operation.

The union carpenters of Vancouver have agreed to accept the new rate of $6.50 per day offered by the contractors. When this schedule was presented a mass meeting was held and when the vote was taken it was found that, while there were a few men desirous of making a fight for the old rate of $7.25 per day, the majority did not wish to go out at this time, and as a consequence were willing to accept the reduced wage.

According to a statement recently made by E. J. Ryan of the E. J. Ryan Contracting Co., Vancouver, B.C., present building costs are 30% lower than they were this time last year. He considers that with this reduction building prices have about reached the bottom as far as 1921 is concerned at least. In figuring this decrease, he considers that the cost of labor has dropped 15% with a corresponding drop in the price of building material.

Thos. Jackson, a 14-year old boy in the employ of the Keenan Woodenware Mfg. Co., Owen Sound, recently had the misfortune to lose his left hand and part of his arm. The young lad was employed as a helper in the factory and was wheeling a wheelbarrow full of shavings to a conveyor. Just as he was passing the saw, the load tipped and in endeavoring to right it, he lost his balance and to prevent himself falling, threw his arm forward, striking the saw.

Hart & McDonagh, wholesale lumber dealers, of Toronto, who have been in the lumber business for the past five years, recently dissolved partnership. R. F. McDonagh, the manager, has formed The McDonagh Lumber Co., with offices in the Confederation Life Bldg., Toronto. It is probable that G. P. Hart, the other partner, and secretary-treasurer of the company, will organize a new company to be known as "Hart, Hamilton & Jackson," with head offices in Toronto.

The plant of the Mill Cut Homes & Lumber Co., Limited, Vancouver, B.C., was completely destroyed by fire recently. The damage was placed at $30,000, and is partly covered by insurance. It is understood that a new factory will be erected as quickly as possible. This company was formerly known as the 20th Century House Co., but was reorganized about a year ago and the name changed to the "Mill Cut Homes & Lumber Co." J. L. Northey is the manager.

A very successful building show was held in Vancouver April 30th to May 7th. One of the outstanding features was a full-sized reproduction of a bungalow, which was given away to one of the visitors. The various manufacturers and exhibitors of building material donated the different material which went to make up this home. Considerable interest was evinced by the general public in this show and it should have the effect of stimulating interest in home building.

The employees of the McAuliffe-Davis Lumber Co., Ottawa, Ont., have voluntarily accepted a reduction of from 10%to 12% in wages. In making this announcement, Mr. Davis intimated that the employees realized that the majority of the proprietors of woodworking plants kept their establishments open last year at a loss in order to provide emp'oyment, and have agreed to accept reduction of from 10% to 12% from existing rates. It is understood that the men in other plants in Ottawa are following a similar course.

The Office Specialty Mfg. Co., Newmarket, Ont., are spending a considerable sum of money in fitting up an adjacent property for an athletic field. They propose constructing bowling greens, baseball diamond, tennis courts and clubhouse. An announcement to this effect was made recently at a meeting of the employees. An athletic association has been formed with the following officers:—H. C. Clemes, honorary-president; R. F. Smith, president; D. Doyle and G. Manning, vice-presidents; and G. D. Wart, secretary-treasurer.

The Cut-to-Fit Lumber Co., Limited, Vancouver, B.C., are reorganizing and have applied to the Provincial Government for an additional loan under the Industries Act. This firm received $50,000 from the Government some time ago, but are again in need of funds and have applied for another loan. It is probable that they may receive $25,000 from this source provided they can secure an equal amount elsewhere. A number of nice orders have been secured and the prospects for future operations are very good provided the increased capital is forthcoming.

United Growers Packages Limited is the name of the company recently organized by the fruit growers of the fruit

WHEN THE ABILITY TO SERVE COUNTS MOST

When things are spotty; when your factory is filled up for a couple of weeks and then is practically empty; when even though you know lumber is a good buy, you are afraid to stock up and instead place rush orders for just what you need—then is when a time-tried lumber organization with a steadfast record for service and dependability, is a real asset. Our many years experience; our diversified and modern manufacturing facilities and the varied assortment of southern hardwoods, rotary veneers and plywood, are as well adapted to give satisfaction in filling to-day's hurried needs as in supplying big contracts in more normal times.

Regardless of your position, this organization merits your investigation.

ANDERSON-TULLY CO.
MEMPHIS

growers of the Niagara district to manufacture baskets, berry boxes and fruit containers. A factory has been secured at Niagara-on-the-Lake and is being equipped with the necessary machines. The initial capacity is estimated at 1,000,000 baskets but this can be increased. T. B. Revett, reeve of Niagara-on-the-Lake, is secretary-treasurer of the company, with A. T. Baker, president; T. A. Griffiths, vice-president, and C. E. Secord and W. H. Hunter, directors.

The furniture workers of Stratford, Ont., have protested to the McLagan Furniture Co., Limited; Stratford Chair Co., Limited; Kindel Bed Co. and the Stratford Mfg. Co., against the proposal to reduce wages 10%. This protest took the form of a resolution as follows: "That we protest against reduction of wages, of which we have received notice, on the grounds that it is not warranted and because of the abnormally low wages which prevail in the furniture industry." It is understood that the hours of work have been lengthened so that the weekly wage will not be any lower under the new rate.

The Unity Mfg. Co., Toronto, is the name of a concern organized a short while ago to manufacture toys and furniture. They have taken over the building formerly occupied by the Victory Cabinet Co., and at the present time are making a line of library tables, chiffoniers, dining room furniture and wheeled toys. About 15 hands are being employed. The output is sold chiefly to the local trade. The equipment, which was purchased from the estate of Green Bros., consists of a number of saws, together with drum sander, band saw, lathe, shaper, swing cut-off, planer and buzz planer. C. Sawyer is controlling the affairs of this company.

At the annual meeting of the Box Manufacturers' Section of the British Columbia Branch of the Canadian Manufacturers' Association, the following officers were elected: Chairman, R. B. Sharpe, of the Pacific Box Co., Limited, Vancouver; vice-chairman, P. J. McMurphy, B. C. Manufacturing Co., New Westminster; chairman of local committees, A. N. Sharpe, of the British Columbia Box Co., Vancouver; chairman of the Export Committee, H. C. Airth of the Westminster Shook Mills, New Westminster. Reports on the activities of the Association for the past year were read and adopted and the policy for 1921-22 outlined.

An amendment to the Factories' Act was submitted in the House recently by the Hon. Walter Rollo, Minister of Labor, which will prevent the employment of minors under 16 years of age, who have not a certificate from the school attendant officer, permitting them to go to work. This amendment will bring the Factories Act into conformity with the Adolescents School Attendance Act, which goes into effect this fall. This latter act raises the compulsory school attendance age from 14 to 16 years and the amendment to the Factories Act will reflect this change. Under the existing law, minors under 14 may be employed if permission is given by the school authorities, and this will now be extended to apply to those under 16 years.

The Trubilt Toy Co., Vancouver, B.C., was recently incorporated with a capital of $500,000. It is the intention of this company to place upon the market five new and extremely simple ideas in multiple building construction invented by H. V. Wesche, a Swedish construction engineer. The large factory formerly occupied by the Terminal Sash & Door Co., has been secured and the necessary machinery, some of which has been specially designed, is being installed. Contracts are being given for a supply of alder bolts. This wood is preferred because it is smooth, hard and splinterless. The business in constructional toys is assuming large proportions. One of the well-known toy manufacturers featuring this line had a turn-over in excess of $13,000,000 last year. The prospects for the Trubilt Toy Co. appear to be exceptionally bright.

W. Turner, manager of the Hardwood Flooring Department of the W. M. Ritter Lumber Co., Columbus, Ohio, visited Toronto recently on a business trip.

Personals

R. R. Gardiner, superintendent of P. W. Gardiner & Sons' plant at Galt, is spending some time in the South in an effort to regain his health.

W. J. Markle, superintendent of the woodworking plant of the Boake Mfg. Co., Limited, Toronto, recently had the misfortune to slip and fracture his leg.

W. H. Cushing, of Cushing Bros., Limited, who operate a large woodworking plant at Calgary, Alta., was in Toronto recently on business and called on several members of the trade.

S. F. Rutherford, managing director of the Dominion Box & Package Company, Montreal, has been elected a member of the committee of the Montreal branch of the Engineering Institute of Canada.

L. L. Brown, B. C. Lumber Commissioner for Eastern Canada, is planning a two-months automobile tour of Western Ontario. He contemplates visiting every town of any importance and calling on the various woodworking firms. His work will be purely educational in the interests of B. C. timbers and forests products. It is his intention to cover the Maritime Provinces in a similar way later on in the year.

Obituary

Archibald Lang, Sr. recently passed away at Toronto. Mr. Lang has been for many years superintendent of the National Casket Co., Toronto.

A. G. McGregor, manager of the Canadian Pipe Co., Limited, Vancouver, B.C., recently passed away at Ottawa, Ont. Mr. McGregor was born in Ontario 54 years ago. He moved to Vancouver, B.C., in 1905 and for the past few years has been engaged in the manufacture of wood pipes.

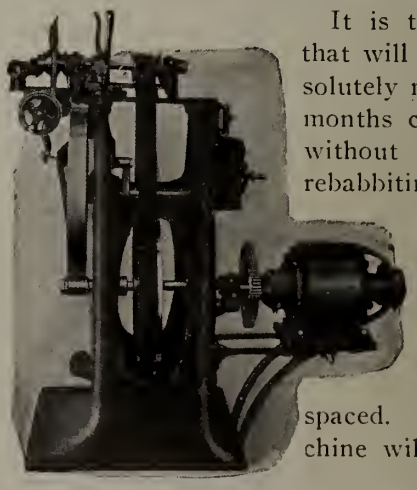
Chas. Slemin, vice-president of the Yawman & Erbe Mfg. Co., Rochester, N.Y., an associate organization of the Office Specialty Co. of Newmarket, died recently at his home in Rochester. He was born in Toronto 62 years ago and had been with the Rochester company for the past 30 years. Mr. Slemin was the father of Harry T. Slemin, managing director of the Office Specialty Co., Newmarket, Ont.

John Piggott, the well-known lumberman and woodworker of Windsor, Ont., recently passed away at the age of 78 years. Mr. Piggott was favorably known throughout Western Ontario where he conducted business in Windsor and Chatham under the name of John Piggott & Sons. This company was reorganized two years ago when the sons bought out the father's interests, Percy G. Piggott taking possession of the Chatham business, changing the name to P. G. Piggott Lumber Co., and Walter T. Piggott assuming the Windsor end of the organization under the name of W. T. Piggott Lumber Co. The Chatham business was founded in 1869 and was extended to Windsor in 1894 when the interests of W. G. Nutson, Windsor, were purchased.

The Berry Combination Band and Circular Automatic Saw Sharpener

Belt or Motor Driven. Capacity: Bands, 3-16" to 4", Circulars 4" to 32". Simple, Universal, Automatic in Action.

It is the only *combination* grinder that is *automatic*



It is the only grinder that will grind a saw absolutely round after three months continuous use—without readjustment or rebabbiting. It will take an unevenly spaced, hand-filed saw and make it perfectly round and even spaced. No other machine will do this.

For All Shops Using Circular or Band Saws

The Berry Tooth is far superior to the ordinary peg tooth. All teeth are alike, evenly spaced—ground right from the center. A saw ground with this machine does twice the work in half the time.

Write for Booklet to-day.

O. V. HOOKER & SON

St. Johnsbury Vermont

Once upon a time

Why our Gum does not stain

Gumwood was despised; considered a cheap unreliable wood. Today its use predominates in the higher grade manufactures and crafts.

What has brought about this change?

Intrinsic merit partly, but **improved methods of production, handling and treatment are the important contributing factors.**

True, some manufacturers, attracted by low prices on an inferior product of Gumwood, lacking the necessary care and attention in handling and treatment, continue having some difficulty, but this is **unnecessary and tremendously expensive.**

The **right kind of Gumwood** offers to the purchaser the greatest value for the money expended of any wood on the market.

The price of the best is so low—intrinsic value considered—that it is folly to be tempted by a slightly lower price on inferior stock.

The lowest intial cost invariably means a higher ultimate cost. **It is the ultimate cost that determines value.**

Our Kraetzer-Cured Gumwood represents the acme of quality and dependability: as straight and flat as any wood, and bright, free from the stain and discoloration, which many people think must be expected in the sap part of Gumwood.

And uniform—one board like another; one car like another. These things can be accomplished by **no other means** and obtained from **no other source.**

Only the very rich can afford the extravagance of poor quality. Every board is branded.

One reason why our Gum is Straight and Flat

THE KRAETZER-CURED LUMBER CO.

Our protection—Your guarantee

The Kraetzer-Cured Lumber Co.

GENERAL OFFICE: GREENWOOD, MISS.

Band Mills: Greenwood, Miss., Moorhead, Miss.

Our Quartered and Plain Red and White Oak, Ash, Hickory, Red Gum and Tupelo are as fine as the highest quality of virgin timber and thorough knowledge of production can produce.

THERE IS NONE BETTER.

Electricity in Glue Room

Another application of electricity that is finding favor in woodworking plants is in connection with electric heaters for heating animal glues. This type of glue pot, or heater, has advantages possessed by few other methods of heating glue. With the electric heater there is no flame, no gas, no smoke, no soot, no steam, only a clean pot and a flexible cord.

In many types of electric heaters the glue is automatically maintained at the correct temperature, ensuring satisfactory results. For the most satisfactory results glue should be maintained at a temperature of 140 to 150°. If the temperature is allowed to rise above this point, the adhesiveness and strength of the glue is impaired, perhaps causing trouble from open joints or loose veneers at some later date. It has been stated by experts who have made a study of glues that when the temperature is permitted to climb as high as 185°, the glue is rendered practically useless.

Electric glue heaters may be divided into two classes—wet and dry. In the wet type, a water jacket or bath surrounds the glue pot proper, while in the dry type the water is replaced by a suitable heating unit and the glue pot is surrounded by a heat insulating dead air space. Where the automatic temperature control is used, it can be adjusted to maintain the glue at any desired heat. In another type provision is made for three different temperatures—low, medium and high. The high heat is used for melting only, and as soon as the glue is brought to the working temperature the medium heat is turned on. The low heat is used when the heater is not in use but when it is desired to keep the glue hot and ready for instant use.

Some of the advantages claimed for electric heaters are that there is no burned glue; that they are portable and can be attached to any lamp socket; that they are safe, clean and eliminate all fire risk. These are features which should command this type of heater to all woodworkers.

When to Machine Casein Glue Joints

Casein glue sets very quickly and produces a joint strong enough to machine in a few hours. In tests at the Forest Products Laboratory casein glue joints in spruce proved as strong as the wood after 4 hours and in hard maple after 6 hours. When maximum speed of production is essential, such woods may be machined at the end of the periods stated, without sacrificing the strength of the joint. In some kinds of work, however, machining so soon after gluing is not advisable, because of the danger of warping or the production of sunken joints as the moisture content of the glued wood equalizes.

Another important act brought out by the tests on joint strength is that joints released from pressure at the end of 2 hours and then allowed to season for 22 hours proved as strong as those that had been pressed for 24 hours. Joints pressed for only ½ hour and seasoned, although of good strength, on the average, were somewhat erratic in this respect and probably would not be dependable where maximum strength is important.

It is a big asset to a firm when the employees realise that they can always depend on it for a square deal.

The Sidman Lumber Curing Dry Kilns

Here is shown a Class D Kiln having a capacity of 30M per week of Hardwood lumber at the plant of the

STEVENS-HEPNER CO. Ltd.

PORT ELGIN, ONT.

This Kiln is poured concrete with an air spaced roof. With our design it is both moisture and heat proof. Making a good and inexpensive kiln building where you can get gravel and sand free from dirt.

We also have these concrete kilns in two plans each in Southampton and Walkerton, and at Hespeler, Ont.

Do not forget! All Sidman Kilns are made in Canada. No duty or exchange to pay.

THE SIDMANS of CANADA

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IN TRANSIT YARD
TORONTO

Million Feet Bone Dry Hardwoods

Orders can be filled immediately

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H. W. PETRIE
LIMITED

CANADA'S DEPENDABLE
MACHINERY and SUPPLY HOUSE

NEW AND USED
WOODWORKING MACHINERY

Let us Quote on Your Requirements

131-147 FRONT STREET WEST TORONTO

HAMILTON OFFICE: 4 KING STREET WEST

General Woodworking Trade Mart

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Equipment Materials Employment

For Sale

Sash, door and planing mill machinery, boilers, engines, motors, pulleys, gears, machine shop and moulding machinery. 8 ft. Linderman glue jointer. Full printed list on request. Cargill Limited, Cargill, Ont. 3-6

Factory For Sale

Brick Building, (in live city within 50 miles of Toronto). About 40,000 sq. feet floor space; well lighted on all sides; completely equipped power and heating plant. Building facing main line railway presents excellent advertising possibilities. Suitable for wood-working or light manufacturing. Write for particulars. Box 108, Canadian Woodworker, Toronto, Ont.

Woodworking Plant

For Sale or To Rent

Manufacturers in good lake town, north of Toronto, making products of Wood and Iron, have discontinued the Wood lines and their Woodworking Shop with all or part of the machinery and equipment for sale, at a low rate on the dollar or for rent, at a low rate for a year or more, with option of purchase.

Building is a separate unit, modern concrete mill construction, 60 ft. x 100 ft., two storeys, complete with machinery, 200 H.P. Steam Plant, Belting, Shafting, Shaving Exhaust System, Dry Kilns, Elevators, Plumbing, Electric Wiring, Railway Sidings, large yard, etc., ready to step into for immediate operation.

Box 107, Canadian Woodworker, Toronto, Ont.

For Sale

Band saws, Crescent 36-in.
Dowel machine, Crescent No. 1 double head.
Edging saw, Falls chain feed, with motor.
Glue jointer, Berlin No. 213 continuous feed.
Moulders, American and Egan, 7-in. and 10-in.
Planers, Whitney 30-in. single; Smith 30-in. single, with round heads, sec. roll and sec. chipbreaker; Fay and Egan No. 200 double, 30x7, with round heads, sec. roll, sec. chipbreaker, and electric grinder, 3 yrs. old.
Rip saw, Greenlee self-feed.
Sander, Perry 2-drum; Super-hand drum, with iron table, 24-in. wide.
Surfacer, single 30x7 American-Frank Clement No. 4½.
Swing saws, Aemrican and Superior.
Tenoners, double end, Hayes and American.

W. F. Schumacher Machinery Co.,
1312 W. Madison St. Chicago, Ill.

Clamps For Sale

141, Iron, Colt Clamps in first class condition. Apply Gold Medal Furniture Co., Toronto.

GOOD VALUES

Subject to Prior Sale

Sticker, Hermance Machine Co. 10" 4 Side.
Moulder, Woods No. 2 10" inside.
Moulder, American 10" 4 Side.
Sander, Endless Bed 48" H. B. Smith.
Belt Sander, Curtis No. 20.
Sander, Moore Machine Co. Standard.
Matcher, American No. 229 Fast Feed Hardwood Flooring.
Matcher, American No. 22 24" 4 Side.
Band Resaw, Connell & Dengler 60".
Band Resaw, Mershon 44".
Band Rip Saw, American No. 1 Power Feed.
Circular Saw Mill, Hoosier Pony.
Jointer, Falls Machine Co., Undercut 24" Power Feed.
Buzz Planer, 24" Buss Machine Works.
Lathe, Back Knife Clement 36".
Planer, 30" Fay & Egan Single Cabinet.
Dowell Rod Machine, E. B. Hayes.
Dowell Gluer and Driver, E. B. Hayes.
Door Clamp, E. B. Hayes Standard Powers.

Woodworking Machinery Company of Buffalo,
54 Mechanic St.,
Buffalo, N.Y.

Don Pedro Dam to be Built by Day Labor

After twice receiving and rejecting bids for the construction of the Don Pedro dam on the Tuolumne River, California, to store water for the use of the Turlock and Modesto irrigation districts in the San Joaquin Valley, a joint board has decided to have the work done by day labor instead of by contract.

The dam is to be built on a simple curve with a radius of 675 ft. It will be 280 ft. high, 975 ft. long on the crest, and will contain 266,000 cubic yards of concrete. Only about 10,000 cubic yards of excavation are said to be necessary to expose solid rock underlying the site, but about 120,000 cubic yards of excavation will be made in cutting a spillway channel in the canyon wall at the north end of the dam.

The construction program includes building a narrow gage railroad from the Southern Pacific line at Hickman to the dam site, a distance of 29 miles. About 12 miles from the dam site this railroad passes through gravel pits from which gravel for the concrete will have to be taken. It is estimated that the work can be completed in two years time at a total cost of approximately $4,000,000.

The Opportunity Is Yours

Investigate the following dependable and up-to-the-minute used Wood Working Machines:

"Subject to prior sale"

CORDESMAN Band Resaw, 42" wheel, 5" blade, rolls open 3" each side of saw blade.

1—**WOODS** 15 x 6" Planer and Matcher, in excellent condition. Recently replaced by Yates Fast Feed Machine.

MACGREGOR 26" x 8" Double Surfacer, an excellent buy.

YATES No. 160 Double Surfacer, 30 x 6". This machine has been rebuilt and is as good as new.

H. B. Smith 8" Sticker, in excellent condition.

We solicit your inquiries.

M. E. Casey Co.
Limited
263 St. James St. Main 411
MONTREAL

METHOD IS THE BEST
for making mitered, butt or any other joint
Used by all leading Furniture, Cabinet and Casket Manufacturers.

In using "*Steelgrip*" CLAMP NAILS only the ordinary machine work is required. Cut a slot, drive in a "Steelgrip," that's all. No clamping, no waiting for glue to set.

"*Steelgrip*" CLAMP NAILS
Save Time + Labor = Money
Produce, Strength + Durability = Better Produce

For sale by dealers in Cabinet Hardware, or direct if you so prefer.

CLAMP NAIL COMPANY
4532 PALMER STREET, CHICAGO
CIRCULARS and SAMPLES ON REQUEST.

Subscribers' Information Form

Many letters reach us from subscribers enquiring where certain goods can be obtained. We can usually supply the information. We want to be of service to our subscribers in this way, and we desire to encourage requests for such information. Make use of this form for the purpose.

Date.....19

"CANADIAN WOODWORKER"
345 Adelaide St., West, Toronto

Please tell us where we can secure (give description as fully as possible) .....

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Name .....

Address .....

THE CHICAGO MIRROR
AND
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Manufacturers
of
RELIABLE MIRRORS
AND
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Send your specifications
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216 NO. CLINTON ST., CHICAGO, ILL.

Steel Clamp Nails

The best labor saving device made, for making mitered joints for Furniture, Cabinet, Table, Phonograph and Casket Manufacturers.

Write for samples and prices.

Wm. Siegler & Son
115-117 S. Clinton St. CHICAGO, ILL

Must the Printing Industry Follow the Building Trades to Stagnation?

An unheard of condition exists in the building trades in Canada.

Everywhere there is a crying need for homes, but practically none are being built.

Why?

Because the cost is considered prohibitive. Labor and materials are so high that the man who contemplates building a home for himself counts the cost, and decides he cannot afford it.

The result, of course, is increased demand for houses to rent—and higher rents—and no one knows the end.

We don't want this stagnation to occur in the printing industry, but employers are right now faced with a demand from the International Typographical Union that the 44 hour week shall be the basis for all wage scales and the Toronto Unions are demanding a wage of $44 per week. This will add 36 per cent. to the wage bill of Toronto job printers and publishers, other than those of daily papers.

Does anyone feel that under present economic conditions an increase from 73c per hour to $1.00 per hour for printers is justified?

Does anyone believe that the effect of such an increase in the labor cost of printed matter, can be other than harmful to the industry as a whole?

Printers can only find employment as long as users of their product continue to buy.

Will there not come a time, when—if costs keep on mounting—printers will find themselves in the same position as many highly skilled carpenters, bricklayers, plasterers, and painters are now in. They are willing and anxious to work but cannot find a market for their services.

This is a matter in which the buyers of printing—the subscribers to this and other papers—and the advertisers—are vitally concerned. An increase of 36% in the wage bill of publishers would necessarily involve an increase in subscription price and advertising rates.

That is plain.

Publishers would be very reluctant to add one cent to the present subscription price of their papers or to effect any increase in advertising rates, but they cannot possibly absorb any such addition in wage costs as is proposed, and stay in business.

An expression of the opinion of readers of this paper on the Unions' proposals, involving an increase of 36% in the labor cost of printed matter, is asked. Will you not write a letter to the editor (not for publication) telling him your view of the situation.

Don't let us drive the printing industry into the condition of the building trades.

This statement is published by and has received the endorsation of the Toronto publishers who are members of the

Canadian National Newspapers and Periodicals Association

including Canadian Woodworker and Furniture Manufacturer.

"The Phillips Line"
Window Frame Machines

This is the work ☞

Let us tell you about the machine.

Testimonials from hundreds of satisfied users.

F. V. Phillips invented and built window frame machines for 40 years. "The Phillips Line" is the culmination of his efforts.

Your inquiries solicited.

Address Dept. C.W.

Atlas Mfg. Co. of Orlando
Orlando, Fla., U. S. A.

Mr. G. P. HART announces

that his connection with the firm of

HART & McDONAGH
Wholesale Lumber

has been discontinued and that the business will now be conducted under the name of

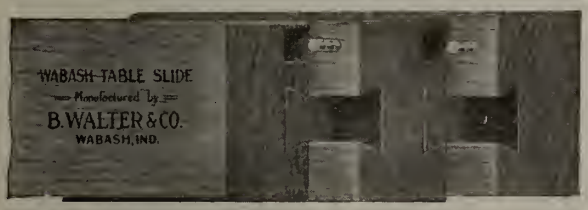
Hart, Hamilton & Jackson

Wholesale Lumber

in new quarters

701-702 Bank of Hamilton Building,
TORONTO

THE SLIDE IS THE HEART OF YOUR EXTENSION TABLE



If the Slide Does Not Work properly Your Whole Table is Condemned

Wabash Slides insure Satisfied Customers

SLIDE MAKING is a SPECIALTY BUSINESS

We can Furnish Better Slides for Less Cost

Eliminate Slide Troubles by using WABASH SLIDES

MADE BY

B. Walter & Company
Edsall St., Wabash, Ind.

The Productimeter

A real lumber meter of extremely substantial construction, making it more than equal to the hard usage to which it is sure to be subjected in wood-working plants.

For use on moulders, matchers, stickers, flooring machines, and self-feed rip saws.

Other designs for other machines. Mention the machine whose output you want to count, or measure, and we will send you the right Productimeter for a 30 days' trial.

Get our complete Catalog

The Durant Manufacturing Co.
615 Buffum St. MILWAUKEE, WIS.

ONTARIO

HAS 123

GRAND RAPIDS VAPOR KILNS

IN 22

BRANCHES OF THE WOODWORKING INDUSTRY. AN OUTPUT OF 129,888,000 FEET PER ANNUM

GRAND RAPIDS VAPOR KILN
GRAND RAPIDS, MICHIGAN

WESTERN VAPOR KILN CO. SEATTLE, WASH.

The Peter Hay Knife Co., Ltd.

Manufacture the Best
PLANER KNIVES
and CUTTERS
OF ALL DESCRIPTIONS

The Peter Hay Knife Co., Limited
GALT, ONTARIO

PRESSES

For Veneer and Veneer Drying

Made in Canada

William R. Perrin
Limited
Toronto

Cary's SUPERIOR QUALITY Corrugated Fasteners

SAW EDGE

PLAIN EDGE

According to final decision, after long litigation, we have been granted the SOLE RIGHT to manufacture a Saw Tooth Corrugated Fastener with a continuous cutting edge. Our fastener is beveled evenly on both sides, which enables fasteners to be driven in straight, and much easier than any other fastener made. Our Corrugated Fastener is made in various widths and corrugations, also in coils wound right and left. Try our products and you will use no other.

Samples and prices on request.

CARY MFG. CO., Brooklyn, N.Y.

The lightest running and best wearing belt.
Famous on two Continents.

South American Buffalo

FOR HIGH SPEED and STRONG PULL

French and Swiss Steer

"Chicago Rawhide" and "Chrome" Belting

RAWHIDE
Gears
Pinions
Frictions
Hammers
Lacings

KROME
Lacings
Washers
Gaskets
Cups

HIDES
Any Grain, Color or Finish in the Finest Cowhide.

Chicago Rawhide Manufacturing Company

Formerly Mechanical Leather Specialties Co.

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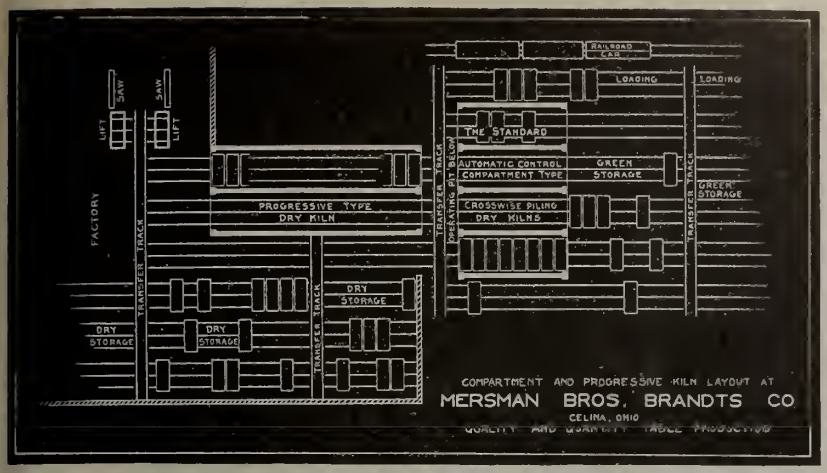

IF you are interested in kilns get our new literature. It gives layouts such as this and contains much of help to operators.

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1542 McCarty St. Indianapolis

A REAL SANDPAPER SAVER

Save 25 Per Cent of Your Sandpaper by Using

The Loeffler Close - Joint Sanding Drums

Patents Pending.

Save time; change your paper in 5 minutes.

Loeffler Drums do better work because they are turned perfectly true, have no vibration because they have a perfect running balance and an unnoticeable joint.

Satisfied users are saving over 25 per cent. of sandpaper with the Loeffler Drums.

Sixes in 9, 16 and 20-in. diameters, 24 to 36-in. face.

We also build interchangeable close-joint drums to fit your drum arbors.

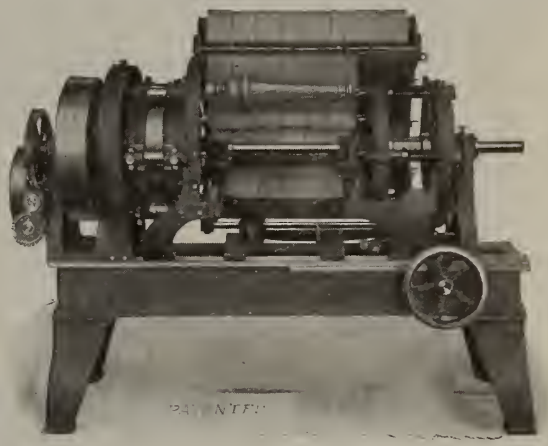
Edge belt sanders—Belt sanders—Drum sanders. It will pay you to investigate.

The Wm. LOEFFLER MACHINE COMPANY

Manufacturers of Chair machinery

SHEBOYGAN - - WIS., U. S. A.

Don't Ignore Anything



that will help you to reduce costs and eventually prices.

The Nash No. 10 Sander for furniture turnings can do the work of from 5 to 15 men and do it better.

Just ask me to prove this.

J. M. NASH, Milwaukee, Wis.

Automatic Hole-Cutting Machines

The Wheel and Hole Cutting Machine has four automatic movements, all of which work in perfect unison, performing their functions in clock-like regularity.

The Hand-Hole Machine will cut hand holes in crate and box ends. It is worked by a carriage and levers, and will cut any size or length hole with either round or bevel edge in any kind of wood.

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S. S. SEE, Manager

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"Pony" Cabinet Clamp

For lightness combined with strength this clamp has no equal. All parts are selected from the best materials obtainable and we have spared no effort to make the "Pony" the finest thing of its kind on the market. Made in sizes to open 18 in. to 72 in.

"Jorgensen"

Peerless Adjustable Hand Clamp

Fits every grip without a slip and takes a tighter hold with less effort. It is a tool of real economy and a clamp that insures efficiency.

Adjustable Clamp Company

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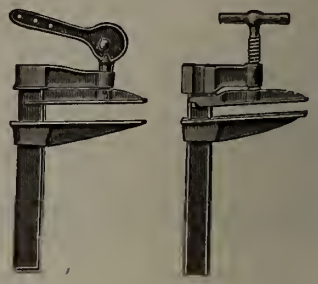
Colt's Clamps

for the

Woodworker



Colt's Universal and Vise Clamps are unsurpassed for the Furniture Manufacturer and General Woodworker. They are made right, both in design and quality of materials and workmanship.

Colt's Clamps are quick-acting and have broad jaw clamping surface.

For further information write for Catalogue No. 294.

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235 Centre St. **BATAVIA, N. Y.**

Cabinet Makers' Benches, Clamps and Hand Screws

Manufactured by

C. CHRISTIANSEN

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Better work follows the use of the "Empire"

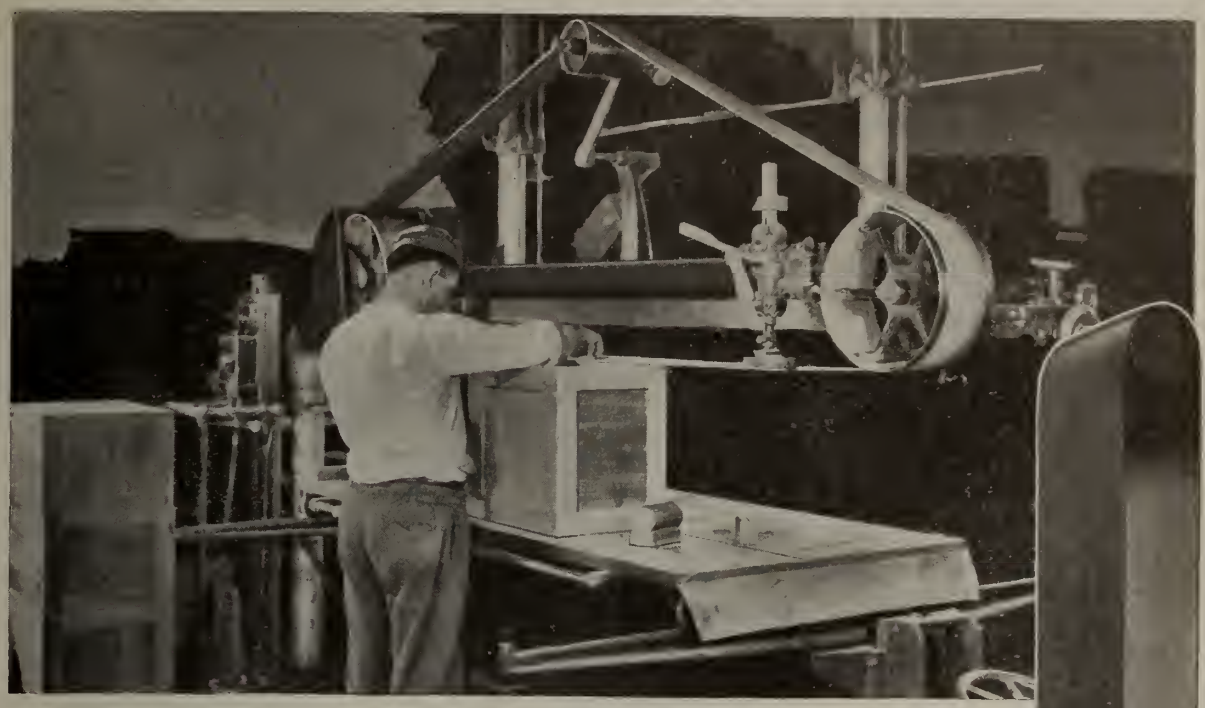
There is no question about it. EMPIRE all steel clamps do the work with less chance of failure than any other you can purchase. In scores of shops where they are in daily use results bear out the truth of this statement. If you will try them once you will be convinced.

Get in touch with us now. We can make prompt delivery from stock.

We specialize in all types of woodworking tools.

Empire Tool Works

Toronto - Ontario



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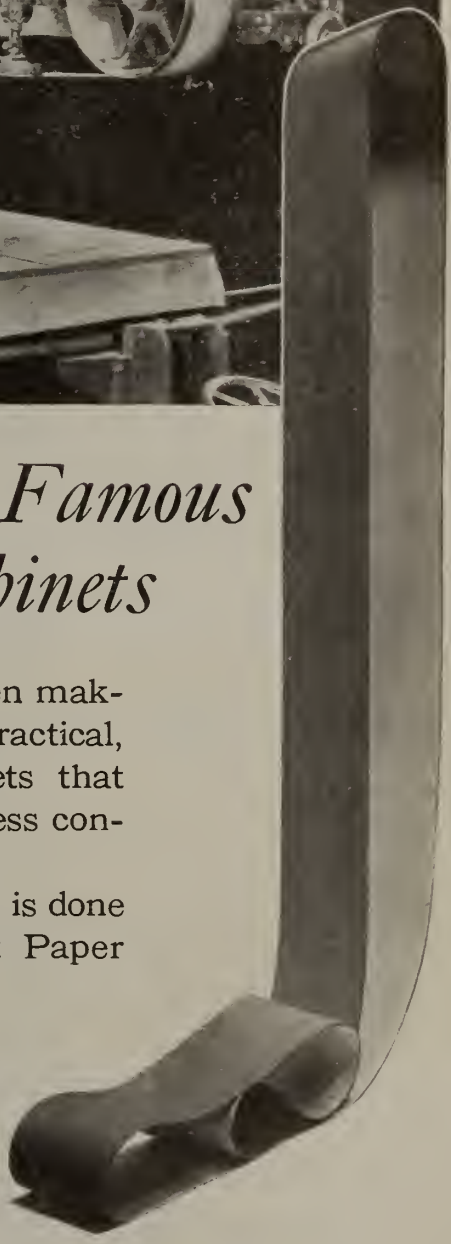
All of the sanding of these cabinets is done with Carborundum Brand Garnet Paper and Cloth.



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Paasche Air Brush Co., Chicago, Ill.

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Preston Woodworking Machinery Company, Preston, Ont.
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Cowan & Company, Galt, Ont.
Empire Tool Co., Toronto, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Preston Woodworking Machinery Company, Preston, Ont.

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CLAMP NAILS
Clamp Nail Co., Chicago.
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Disston & Sons, Henry, Toronto, Ont.
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Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
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Yates Machine Co., P. B., Hamilton, Ont.

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Garlock-Walker Machinery Co., Toronto, Ont.
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Yates Machine Co., P. B. Hamilton, Ont.

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Cowan & Company, Galt, Ont.
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Dry Kiln Door Carrier Co., Indianapolis, Ind.

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DUST SEPARATORS
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Canada Machinery Corporation, Galt, Ont.
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Garlock-Walker Machinery Co., Toronto, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.

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Garlock-Walker Machinery Co., Toronto, Ont.
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Williams Machinery Co., A. R., Toronto, Ont.
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Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont
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Canadian Blower & Forge Co., Kitchener, Ont.
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Canadian Blower & Forge Co.
Neville-Cooper Co., Toronto.

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Atkins & Co., E. C., Indianapolis, Ind.

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Canada Machinery Corporation, Galt, Ont.
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Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
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Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

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Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Yates Machine Co., P. B., Hamilton, Ont.

Alphabetical Index to Advertisers, Page 12

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1 in., 1¼ in., and 1½ in. Dry Basswood

Dry Birch Stock

We offer in **Birch** and **Maple**
End Stock 1 x 7 in., and wider, 1 x 6 in.

All thicknesses and grades in
MAPLE, BIRCH, ELM, BASSWOOD and BROWN ASH

Spruce, Hemlock and Pine

Can saw to order at MacDonald's Siding and Powassan

Let us Quote on Your Requirements

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Rooms 7 and 8 Robinette Chambers
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Chair, Cane-Cutting and Bending Machines

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Your requirements in Reed Forms for Wicker Work Furniture, Mechanic's Tool Cases, Dowels, Novelties, Cedar Chests, Piano Lamps, Table Lamps, etc., can be promptly supplied by us.

We are always pleased to quote prices and give any information you may desire. Try us on your next order.

THE
Brantford Pattern Works
BRANTFORD

Sale of Machinery

We are offering for cash the following machines only, at prices which speak for themselves. Bring your mechanic to inspect them:—

1 Automatic Knob Machine, with quantity of cutters	$ 100.00
1 Jig Saw, Goldie & McCulloch	75.00
1 Jig Saw, McGregor-Gourlay, wood top	50.00
1 American Double Disc, 36" Sander, adjustable tables	250.00
2 American Three-screw Veneer Presses, 38" wide. Each	50.00
1 Gravity Swing Cut-off Saw. McGregor-Gourlay	75.00
1 12" Moulder, Cowan & Co., 4-sided	650.00
1 16" Buzz Planer, Clark-Demill	175.00
1 No. 5 Buffalo Blower	50.00
1 No. 3 Sturtevant Blower	25.00
1 Band Saw, 34", McGregor-Gourlay	175.00
1 Chisel Mortiser, McGregor-Gourlay	125.00
1 Tennant Machine, McGregor-Gourlay	200.00
1 3-sided 7" Cowan & Co. Moulder	200.00
1 Chaser Grinder, Modern Tool Co.	100.00
1 Double Exhauster, 45", American Blower Company	150.00
1 C. M. C. No. 212 Double Surfacer, 30"	1,000.00
1 Sash Sticker, H. W. Petrie	75.00
1 No. 3 Weymouth Lathe for Handles	225.00
1 Dowelling Machine, M31, Cowan No. 2, cap. up to 2½"	300.00
1 S. A. Woods Matcher and Planer, 15" x 6"	1,400.00

Other machinery and supplies at corresponding prices

General Machinery Company
67-69 Frederick St., Toronto
TELEPHONE MAIN 2200

"Canadian Woodworker" Buyers' Directory—Continued

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Perkins Glue Company, South Bend, Ind.
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Yates Machine Co., P. B., Hamilton, Ont.

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Fay & Egan Co., J. A., Cincinnati, Ohio.
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Garlock-Walker Machinery Co., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

GRINDERS (Knife)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDERS (Tool)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GROOVERS
Atkins & Co., E. C., Indianapolis, Ind.

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Brown Bros. & Co., New York.

HARDWOOD LUMBER
American Column & Lumber Co., Columbus, Ohio.
American Hardwood Lumber Co., St. Louis, Mo.
American Oak Mfrs.' Assn., Memphis, Tenn.
American Walnut Association, Washington, D.C.
Anderson-Miller Co., Toronto, Ont.
Anderson, Shreiner & Mawson, Toronto, Ont.
Anderson-Tully Co., Memphis, Tenn.
Arkla Lumber & Mfg. Co., St. Thomas.
Arrow Lumber Co., Parkersburg, W. Virginia
Atlantic Lumber Company, Toronto, Ont.
Bacon Lumber Co., Cleveland, Ohio.
Banning, Leland G., Cincinnati, Ohio.
Barr- Holaday Lumber Co., Greenfield, Ohio.
Barlett Lumber Co., W. C., Charleston, Va.
Bedna Young Lumber Co., Jackson, Tenn.
Biglow-Cooper Co., Bay City, Mich.
Bonner & Sons, J. H., Memphis, Tenn.
Brown Bros. Co., New York.
Brown & Company, Geo. C.
Brown & Hackney, Inc., Memphis, Tenn.
Bruce Co., E. L., Little Rock, Ark.
Burns & Knapp Lbr. Co., Conneautville, Ohio.
Bury & Company, Robert, Toronto, Ont.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Conkling Lumber Co., Frank A., Memphis, Tenn.
Canadian General Lumber Co., Toronto, Ont.
Chicago Mill and Lumber Co., Chicago, Ill.
Clark & Sons, Edward, Toronto.
Dacus-Richards Hardwood Co., Memphis, Tenn.
Darnell-Love Lumber Co., Leland, Miss.
DeHewit Lumber Co., Huntington, Va.
Dooley Lumber Co., F. T., Memphis, Tenn.
Evansville Band Mill Co., Evansville, Ind.
Frye Lumber & Veneer Co., J. W., Dayton, O.
Gayoso Lumber Co., Memphis, Tenn.
Gill Lumber Co., Chas., Wausau, Wis.
Hall Lumber Co., Thos., Charleston, W.Va.
Heeney, Percy E., Kitchener, Ont.
Hyde Lumber Co., South Bend, Ind.
Kosse, Shoe & Schleyer Co., Cincinnati, O.
Kraetzer-Cured Lumber Co., Greenwood, Miss.
Leach & Co., J. D., Chicago, Ill.
Liverpool Hardwood Co., New York.
London Lumber Co., London, Ont.
Long-Knight Mfg. Co., Indianapolis, Ind.
Luehrman Hardwood Lbr. Co., St. Louis, Mo.
May Bros., Memphis, Tenn.
McLean Mahogany & Cedar Co., Buffalo, N.Y.
McLennan Lumber Co., Montreal, Que.
Memphis Band Mill Co., Memphis, Tenn.
Mengel Co., Louisville, Ky.
Merceau-Hawkins Tie Co., Huntington, W.Va.
Mowbray & Robinson, Cincinnati, Ohio.
Murrelle Lumber Company, Memphis, Tenn.
Nicholson & Co., E. M., Montreal, Que.
Nichols & Cox Lumber Co., Grand Rapids, Mich.
Otis Mfg. Co., New Orleans, La.
Paepcke Leicht Lumber Co., Chicago, Ill.
Payson, Smith Lumber Co., Minneapolis, Minn.
Pedwell Hardwood Lumber Co., Toronto, Ont.
Perkins Bros., Kelso, Ark.
Peytona Lumber Co., Huntington, W. Va.
Pickrel Walnut Co., St. Louis, Mo.
Powe Lumber Co., Thos. E., St. Louis, Mo
Ritter Lumber Co., W. M., Columbus, Ohio
Rush Lumber Co., Memphis, Tenn.
Sawyer Goodman Co., Marinette, Wis.
Sondheimer Co., E., Memphis, Tenn.
Spencer, C. A., Montreal, Que.
Spotswood & Son, E. R., Lexington, Ky.
Stark & Co., Jas. E., Memphis, Tenn.
Steele & Hibbard Lumber Co., St. Louis, Mo.
Sterrett, Will S., Cincinnati
Stimson Hardwood Co., J. V., Memphis, Tenn.
Stimson & Co., J. V., Owensboro, Ky.
Tallahatchie Lumber Co., Memphis, Tenn.
Tennessee Lumber & Coal Co., Cincinnati Ohio.
Thompson, Katz Lumber Co., Memphis, Tenn.
Thompson & Co., Lewis, Philadelphia, Pa.
Upham & Walsh, Chicago, Ill.
Utley-Holloway Co., Chicago, Ill.
Vail Cooperage Co., Fort Wayne, Ind.
Warren-Ross Lumber Co., Jamestown, N.Y.
Wheeler-Timlin Lumber Co., Wausau, Wis.
Whiting Co., Wm. S., Johnson City, Tenn.
Wisconsin Lumber Co., Chicago, Ill.
Wayne Lumber Co., New York
Wood Mosaic Co., Louisville, Ky.
Yellow Poplar Lumber Co., Coal Grove, Ohio.

HYDRAULIC VENEER PRESSES
Perrin & Company, Wm. R., Toronto, Ont.

INSURANCE
Lee Blakemore, Inc., Toronto, Ont.

KNOBS
Waddell Mfg. Co., Grand Rapids, Mich.

JOINTERS
Canada Machinery Corporation, Galt, Ont.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

KNIVES (Planer and others)
Atkins & Co., E. C., Indianapolis, Ind.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

LATHES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Defiance Machine Works, Defiance, Onio.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochane & Company. Kitchener. Ont.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie. H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

LEATHER (Artificial)
Fibro Mfg. Company, Beverly, N. J.

LEATHER CLOTH
Zapon Leather Cloth Co., New York.

LUMBER MEASURER
Durant Mfg. Co. Milwaukee, Wis.

MACHINE KNIVES
Atkins & Co., E. C., Indianapolis, Ind.
Canada Machinery Corporation. Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Peter Hay Knife Company, Galt, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont

MIRRORS
Chicago Mirror & Art Glass Co., Chicago, Ill.
Hart Mirror Plate Co., Grand Rapids, Mich.

MITRE SAWS
Atkins & Co., E. C., Indianapolis, Ind.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.

MOTOR TRUCK EXTENSIONS
Swedish Crucible Steel Co., Windsor, Ont.

MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A. Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

NAILS
Laidlaw Bale-Tie Co., Hamilton, Ont.

NAILING MACHINES
Morgan Machine Co., Rochester, N.Y.

OIL
Zero Oil Co., Parkersburg, Pa.

OIL STONE GRINDERS
Mummert-Dixon Co., Hanover, Pa.

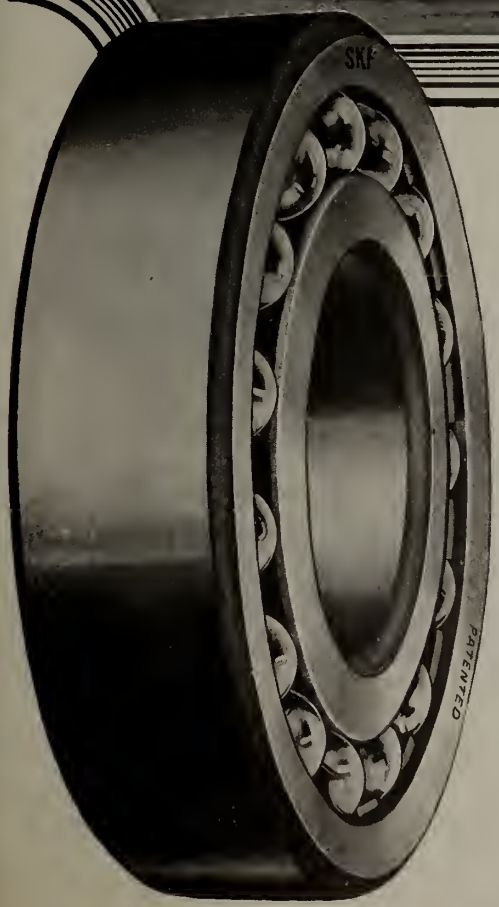
PANELS
Algoma Panel Co., Algoma, Wis.
Gorham Bros., Mount Pleasant, Mich.
Hardwood Products Co., Nennah, Wis.
Hay & Co., Woodstock, Ont.
Holden Company, Henry S., Chicago, Ill.
Roberts, Geo. G., Chicago, Ill.
Waetjin & Co., L., Milwaukee, Wis.

PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Wallace & Co., J. D., Chicago. Ill.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PERIOD MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich.

PERIOD TURNINGS
Decorators Supply Co., Chicago, Ill.

SKF



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TORONTO - - - MONTREAL

"Canadian Woodworker" Buyers' Directory—Continued

PLANERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Colladay Machine Works, Indianapolis, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLANING MILL MACHINERY
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford. Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PRESSES (Veneer)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Jackson, Cochrane & Company, Kitchener, Ont.
Perrin & Co., Wm.. R., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

REED
Carter & Co., E. T., Toronto, Ont.
Overseas Reed and Cane Co., Ionia, Mich.

REED MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

RESAWS
Atkins & Co., E. C., Indianapolis, Ind.
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co.; Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

RIM AND FELLOE MACHINERY
Defiance Machine Works, Defiance, Ohio.
Fay & Egan Co., J. A. Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mackenzie Machinery Co., D., Guelph, Ont.
Mattison Machine Works, Rockford. Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

ROSETTES
Waddell Mfg. Co., Grand Rapids, Mich.

RUBBING MACHINES
DeVilbiss Mfg. Co., Toledo, Ohio.
Mattison Machine Works, Rockford, Ill.

SAFETY DEVICES
Cowan & Company, Galt. Ont.

SANDERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Loeffler Machine Co., Wm., Sheboygan, Wis.
Mattison Machine Works, Rockford, Ill.
Nash, T. M.. Milwaukee, Wis.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SASH, DOOR & BLIND MACHINERY
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SAWS
Atkins & Co., E. C., Indianapolis, Ind.
Disston & Sons, Henry, Toronto, Ont.
Radcliff Saw Mfg. Company, Toronto, Ont.
Seibert & Co., Louis, Cincinnati, Ohio.
Shurly-Dietrich, Ltd., Galt, Ont.
Simonds Canada Saw Co., Montreal, Que.
Wallace & Co., J. D., Chicago, Ill.

SAW BENCH
Wallace & Co., J. D., Chicago, Ill.

SAW SHARPENERS
Hooker & Son, O. V., St. Johnsbury, Vt.

SAW SWAGES
Atkins & Co., E. C., Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Crowel, D. J., Buffalo, N. Y.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Radcliff Saw Mfg. Co., Toronto, Ont.

SAW TABLES
Canada Machinery Corporation, Galt, Ont. ..
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Yates Machine Co., P. B., Hamilton, Ont.

SCRAPING MACHINES
Canada Machinery Corporation, Galt, Ont. ..
Garlock-Walker Machinery Co., Toronto, Ont.
Whitney & Sons, Baxter D., Winchendon, Mass.

SCREW DRIVING MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.
Reynolds Machine Co.. Massillon Ohio.

SCROLL SAWS
Atkins & Co., E. C., Indianapolis, Ind.
Canada Machinery Corporation, Galt, Ont. ..
Casey Co., M. E., Montreal, Que.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Jackson, Cochrane, & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamiltonfi Ont.

SECOND-HAND MACHINERY
Casey, M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Osborne Sexton Machinery Co., Columbus, O.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

SHAPERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Sons, Baxter D., Winchendon, Mass
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SHAVING COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

STAINS
Ault & Wiborg, Toronto, Ont.
Williams Bros. & Co., Hounslow, Eng.

SINGLE SPINDLE BOXING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

STAVE SAWS
Atkins & Co., E. C., Indianapolis, Ind.

STAVE SAWING MACHINE
Whitney & Son, Baxter D., Winchendon, Mass.

STEEL DOOR MATS
Cary Mfg. Company, Brooklyn, N.Y.

SURFACERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Yates Machine Co., P. B., Hamilton, Ont.

SWING SAWS
Atkins & Co., E. C., Indianapolis, Ind.
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Eaglesfield, R. D., Indianapolis, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE LEG LATHES
Fay & Egan Co., J. A., Cincinnati, Ohoa.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE SLIDES
Jefferson Woodworking Co., Louisville, Ky.
Walter & Company, B., Wabash, Ind.

TEMPERATURE REGULATORS
Canadian Powers Regulator Co., Toronto, Ont.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Compan, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TIME CLOCKS
International Business Machines Co., Toronto, Ont.

TOPS
Gorham Bros., Mount Pleasant, Mich.

TRIMMERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Preston Woodworking Machinery Company, Pretson, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TRUCKS
Cowan Truck Company, Toronto, Ont.
National Dry Kiln Co., Indianapolis, Ind.

TURNED WOOD GOODS
Algoma Wood Products Co., Algoma, Wis.
Canada Wood Specialty Co., Orillia, Ont.

TWINES & WEBBING
Doon Twines, Ltd., Kitchener, Ont.

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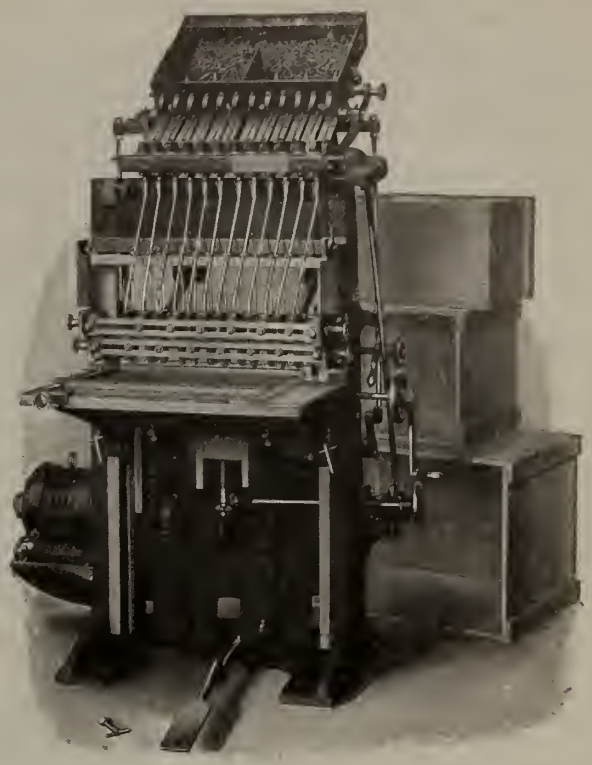

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Veneer
and
Thin Lumber Saws

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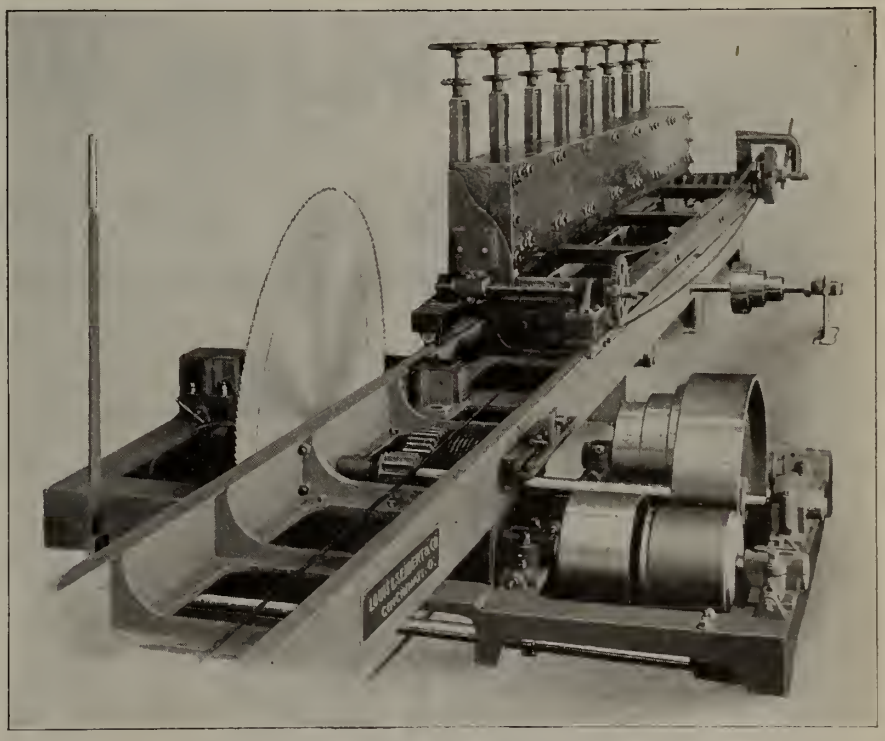

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Louis L. Seibert & Company, CINCINNATI, OHIO

"Canadian Woodworker" Buyers' Directory—Continued

VARNISHES
Adams & Elting Co., Chicago and Toronto.
Ault & Wiborg Company, Toronto. Ont.
Penfound Varnish Co., Toronto, Ont.

VARNISH DRYERS
Nicholls Co.. A. S., New York, N.Y.

VARNISH SPRAYERS
DeVilbiss Mfg. Co., Toledo, Ohio.
Paasche Air Brush Company, Chicago, Ill.

VENEERS
Batesville Lumber & Veneer Co., Lawrenceburg, Ind.
Birds Eye Veneer Co., Escanaba, Mich.
Bury & Compny, Robert, Toronto, Ont.
Central Lumber Co., Indianapolis, Ind.
Christmann Veneer & Lumber Co., St. Louis, Mo.
Curtis Co., C. E., Chicago
Dean Spicker Company, Chicago, Ill.
Empire Veneer Company, Chicago, Ill.
Evansville Veneer Co., Evansville, Ind.
Freiberg Lumber Co., Cincinnati, Ohio
Frye Lumber & Veneer Co., J. W., Dayton, O.
Guelph Patent Cask Co., Scotstown, Que.
Hartzell, Geo. W., Piqua, Ohio.
Hoffman Bros. Company, Fort Wayne, Ind.
Holden, Henry S., Chicago, Ill.
Hardwood Prudocts Co., Neenah, Wis.
Korn-Conkling Co., Memphis, Tenn.
Long-Knight Lumber Co., Indianapolis, Ind.
Litton Veneer Co., Rockford, Ill.
Memphis Veneer & Lumber Co., Memphis, Tenn.
Mowhawk Veneer Co., Warren, Pa.
Munising Woodenware Co., Munising, Mich.
National Veneer & Lumber Co., Indianapolis, Ind.
North Vernon Lumber Co., North Vernon, Ind.
Northwestern Cooperage & Lumber Co., Gladstone, Mich.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod-Jurden Co., Memphis, Tenn.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Veneer Co., New Albany, Ind.
Roberts, Geo. G., Chicago, Ill.
Southern Veneer Mfg. Co., Louisville, Ky.
Stimson Veneer & Lumber Co., Memphis, Tenn.
Talge Mahogany Co., Indianapolis, Ind.
Thompson & Co., Lewis, Philadelphia, Pa.
Toronto Veneer Company, Toronto, Ont.
Veneer Manufacturers Co., Chicago, Ill.
Waetjen & Co., George L., Milwaukee, Wis.
The Williamson Veneer Company, Mills—Baltimore, Md. Sales Branches, New York, N. Y., Chicago, Ill., Jamestown, N.Y., High Point, N.C.
Warren Ross Lumber Co., Jamestown, N. Y.
Wood Mosaic Co., Louisville, Ky.

VENEER SAWS
Atkins & Co., E. C., Indianapolis, Ind.

VENEER TAPE
Canadian Nashua Paper Co., Peterboro, Ont.
Gummed Products Co., Troy, Ohio.
Ideal Coated Paper Co., Brookfield, Mass.

VENTILATING APPARATUS
Canadian Blower & Forge Co., Kitchener, Ont.
Neville-Cooper Co., Toronto.

VENEER JOINTERS
Garlock-Walker Machinery Co., Toronto, Ont.

VENEER MACHINERY
Garlock-Walker Machinery Co., Toronto, Ont.
St. Joseph Iron Works, St. Joseph, Mich.

VENEER PRESSES (Hand and Power)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Perrin & Company, Wm. R., Toronto, Ont.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.

WALNUT LUMBER
American Walnut Mfrs. Assn., Chicago.
Frye Lumher & Veneer Co., J. W., Dayton, Ohio.
Pickrel Walnut Company, St. Louis.
Porter, Frank R. Washington, D.C.
Purcell Walnut Lumber Co., Frank, Kansas City.

WINDOW FRAME MACHINE
Atlas Mfg. Co., Orlando, Florida.

WIRE
Laidlaw Bale-Tie Co., Hamilton, Ont.

WIRE BOX STRAPPING
Cary Mfg. Company, Brooklyn, N.Y.

WOOD FINISHES
Adams & Elting Co., Chicago and Toronto.
Ault & Wiborg, Toronto, Ont.
Penfound Varnish Co., Toronto, Ont.

WOODWORKING MACHINERY
General Machinery Co., Toronto, Ont.
Ober Mfg. Co., Chagrin Falls, Ohio.

WOOD STAINS
Williams Brothers & Co

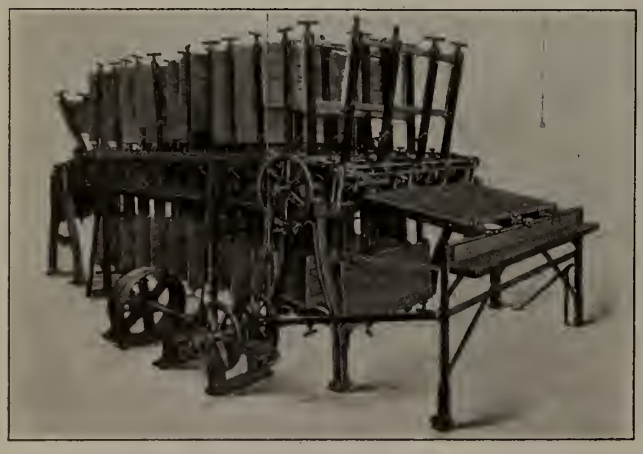
WOOD TURNING MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Yates Machine Co., P. B., Hamilton, Ont.

WORK BENCHES
Fay & Egan Co., J. A., Cincinnati, Ohio.

WOOD LATHES
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOODWORKING SPECIALTIES
Brantford Pattern Works, Brantford, Ont.

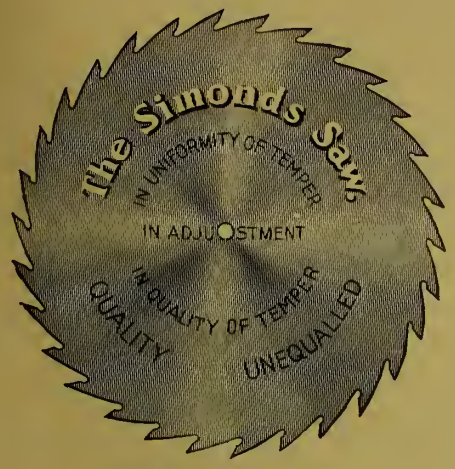
One Man Does the Work of Two
with a Billstrom Glue Clamp Carrier



For every plant where much edge-gluing is done there is a real need for a Billstrom.
Here's why:—

The empty clamp is held at just the right height for the greatest convenience of the workman.
When the clamp is filled he pulls a cord, which carries the filled clamp away and deposits an empty one in its place.
One man can accomplish as much by using it as two men can do employing the old methods.
It holds the work off the floor until the glue has set, when the glued stock can be quickly removed and piled flat, thus greatly conserving space.
It reduces the labor and cost of edge gluing to the minimum.
There is a sizs to suit your particular requirements.

N. J. BILLSTROM
2002 NINTH ST. ROCKFORD, ILL.

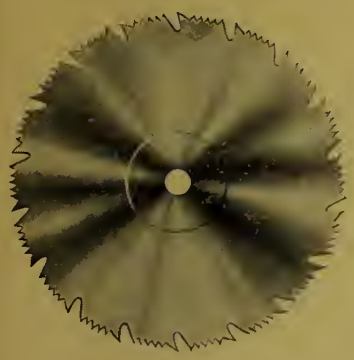


SIMONDS
SAWS and KNIVES

Are made right. Every operation from the making of the steel to the finishing and packing is watched by experienced workmen. The latest appliances known to the metal trades are used to insure the quality of SIMONDS Saws and Knives. After each operation they are inspected by experts for defects in quality and workmanship. The result—as good a saw as human skill and science can make. Prove it to your own satisfaction. Let us quote you on the tools you need.

Simonds Canada Saw Co.
LIMITED
St. John, N.B. MONTREAL, Que. Vancouver, B.C.

ATKINS

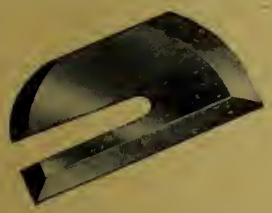


STERLING QUALITY

SAWS and KNIVES

The best steel—the most careful and accurate workmanship—the equipment that will eventually save you money.

Atkins Sterling Quality Saws and Knives are proving their superiority by competitive tests in the largest plants of the country. We welcome your most careful investigation, as we know the satisfaction that will result.



Write to-day for our Knife Booklet "C W"
and Pattern Template Paper.

E. C. ATKINS & CO.

Makers of Sterling Saws

Factory—HAMILTON, Ont. Vancouver Branch—109 Powell Street

"176" in factory of Western Furniture Company, Indianapolis, sanding inside curved edge of a circular cabinet panel against solid sanding roll. The curved frames on the trucks are similarly finished at a very considerable saving over other methods.

MATTISON

176

Oscillating Belt Sander

For Edge and Shaped Work

Successfully employs stationary forms

This shows a narrow-nosed form which provides an accurate and economical method for sanding the curved and flat members of both square and octagonal pieces. The sanding is done with the grain, and the stock is handled but once.

BECAUSE of its substantial construction, this sander is entirely free from vibration, making the use of special forms completely successful.

This feature provides a superior method for sanding the small, flat curves of ornamental square or octagon legs, pilasters, etc. The work is accomplished quickly, accurately and economically. Oscillation of the sandbelt improves quality by eliminating scratch marks.

Such a large variety of flat and curved edge work can be completely finished on this Oscillating Belt Sander, that no furniture factory can afford to do without it.

Send for Illustrated Bulletin Describing this Method in Detail

MATTISON MACHINE WORKS

Rockford, Illinois, U.S.A.

Volume Twenty-One TORONTO, JUNE, 1921 Number Six

CANADIAN WOODWORKER and Furniture Manufacturer

ANOTHER NEW ONE!

This Time it is

A Whitney Direct Motor Driven Bit Mortiser

The Motor is Mounted directly on the Spindle

No Countershaft
No Belts
No Pulleys
Saves Floor Space
Saves Belt Expense
No Slowing Down of Bit

Cuts mortises of uniform depth the entire length.

Makes any size mortise up to 1 1-2 in. wide, 4 1-2 in. deep, and 6 in. long.

Machine can be equipped with power feed for table ifdesired.

Write us or Selling Representative for Booklet:

BAXTER D. WHITNEY & SON, Inc.

WINCHENDEN, MASS.

Canadian Representative: H. W. PETRIE, Limited, Toronto, Ont.

Alphadetical Index to Advertisers, Page 12

No Soldered Joints or Bolted Connections in

Canadian Crocker-Wheeler Rotors

The greatest improvement in modern induction motor design—no soldered joints to melt and cause arcing or open circuits and no bolted connections to work loose. The risk of fire as well as the possibility of motor troubles and consequent delay, is thus greatly reduced if not eliminated entirely.

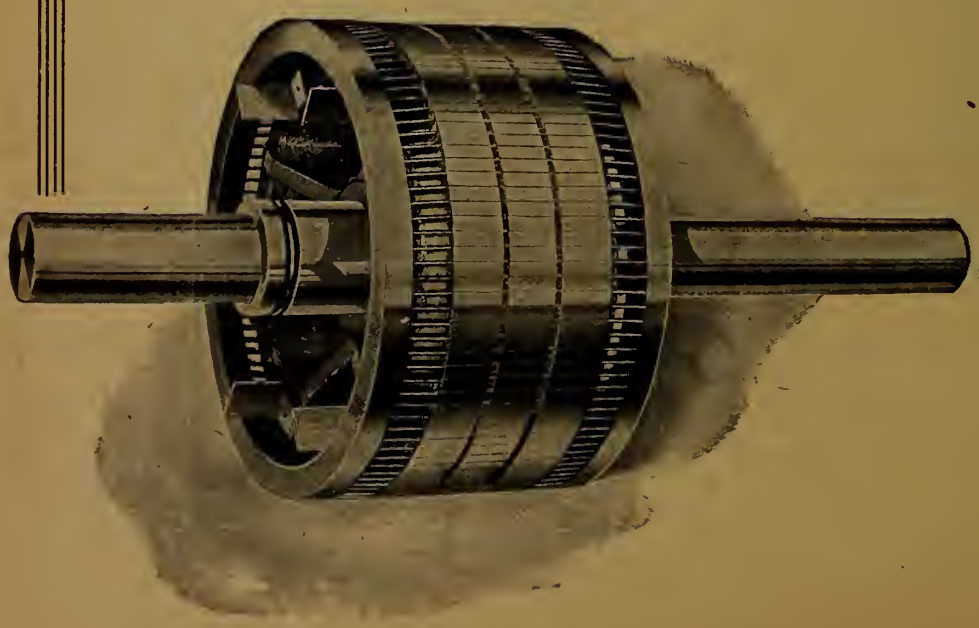
The entire Rotor Winding of small squirrel-cage induction motors is cast of aluminum alloy—in one operation. Thus, the complete winding is one integral structure.

The medium and large size Rotors have liberal section copper bars and the end rings are cast-welded, making perfect contact.

The generous bearing sizes and sturdiness of mechanical construction throughout, further emphasizes the superiority of our motors for woodworking plants.

Northern Electric Company
LIMITED

Montreal	Quebec	Toronto		Windsor	Regina	Edmonton
Halifax	Ottawa	Hamilton	London	Winnipeg	Calgary	Vancouver



In Stock at our Branch Houses

Invest In Your Own Business

These machines will save you money. They are priced to sell under present conditions. All in our Dufferin Street Warehouse, subject to your inspection. Quotations on machines for any purpose on request.

1—McGregor-Gourlay Double Arbor Universal Saw Table, same as C.M.C. No. 618, with 14" saws, self-contained countershaft, full complement of gauges, saws, wrenches, etc.

1—Preston No. 127 Variety Saw Table, countershaft attached, one 14" saw.

1—Ballantine 36" Band Saw, with solid lower wheel, complete with saw blades, wrenches, etc.

1—Ballantine Two Spindle Shaper, Spindles 20½" centres, diameter of spindles where collars go on 1⅛", top 42" x 42".

1—American No. 1 Single Spindle Shaper. Fig. 937 with plain countershaft.

1—C. M. C. No. 507 Mortiser, with boring attachment.

1—C.M.C. No. 624 Hand Feed Rip Saw Machine, with self-contained counter shaft, table 6'6" long by 40" wide, with plain box gauge, 22" saw blades, 1¼" arbor with cone for receiving saws different diameter.

1—Ballantine 8" Four Sided Moulder, complete with square heads and straight knives on all heads.

1—American No. 2½ Single End Tenoner, with two copes and cut-off saw attachment. Fig. 9431 in American Woodworking Machinery Catalog.

1—C.M.C. No. 646 Roller Table Cut-off Saw, sliding table 7'6" long, stationary table 50" to the saw, sliding table equipped with stop gauge, including five stops, with countershaft, complete with saws, wrenches , etc.

1—Cowan Combination Vertical and Horizontal Boring Machine, complete with wrenches, etc.

1—Hespeler 12" Buzz Planer, fitted with round cylinder, full set of knives, countershaft, wrenches, guard, etc.

1—Preston 36" Band saw, lower web wheel and guards.

8—Sections Cowan Four Screw Veneer Press 12"x50", four sections 27" clear space under screw plates, four sections 32" under screw plates.

1—24" Francis Double Roll Glue Spreader.

4—Sections Cowan Three Screw Veneer Press 38"x12", 28" clear space under screw plates.

1—American No. 4½ Single Surfacer, with solid roll and chipbreaker.

1—American No. 26, 10" Outside Moulder, 4" side heads, latest type machine, complete with knife jointers and all equipment, new straight knives on all four heads.

1—C.M.C. Arm Sander, No. 438, with paper cutter.

1—Universal Knife Grinder, 37", made by American Wood Working Machinery Co., Fig. 1126 in their catalogue.

1—60" Sturtevant Single Slow Speed Exhauster, left hand, top vertical discharge, complete with platform and rods to suspend from ceiling.

1—Cowan Chain Mortiser with grinder.

1—Ballantine 36" Band Saw, lower web wheel.

1—American No. 3 Double Cut-Off Saw, new machine, capacity from 8" to 6' 9" in length, 4" thick and 30" wide.

1—American No. 25 Edging and Ripping Saw, new machine.

1—American No. 30 Double Arbor Universal Saw Bench, new machine.

1—Preston 24" No. 121 Pony Planer, used only couple of months.

1—McGregor-Gourlay 24" Pony Planer.

1—Mershon Band Rip Saw.

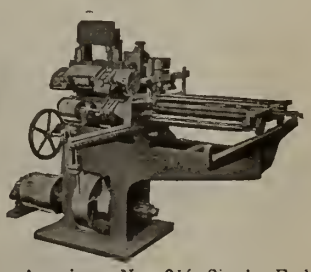
American No. 25 Power Feed Edging and Ripping Saw

Garlock-Walker Machinery Co., Limited

32 Front Street West

WINNIPEG TORONTO MONTREAL

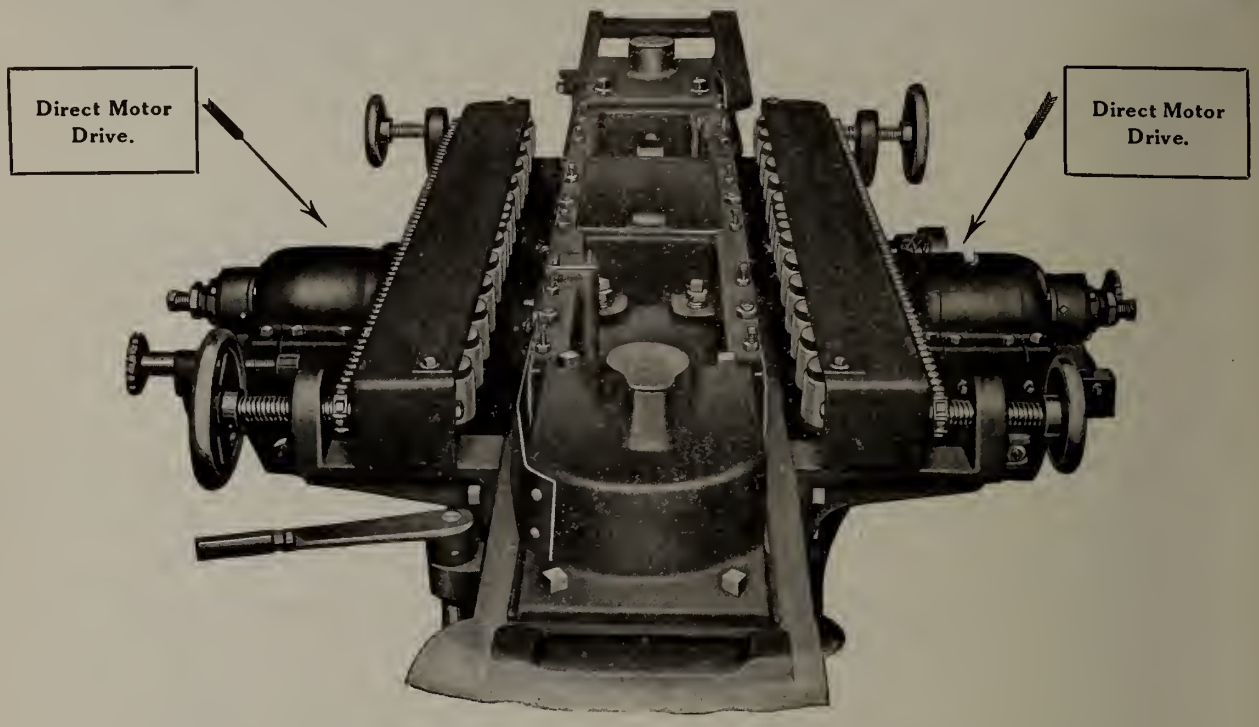
Everything in Woodworking and Metal Working Machinery



American No. 2½ Single End Tenoning Machine

Ball Bearing Direct Motor Drive Glue Jointer and Edge Molder

No Belts **No Countershafts**



No. 429 "Lightning" Automatic Glue Jointer and Edge Molder

With a continuous feed this machine will make the finest glue joints for the highest class of cabinet work many times faster than is possible by hand or on the old reciprocating types. It is the ONLY Automatic Glue Jointer which can be set instantly to make either a straight, hollow or spring joint.

Write for Bulletin H-12

J. A. Fay & Egan Company

ESTABLISHED 1830

World's Oldest and Largest Manufacturers of Woodworking Machinery

153-173 West Front Street, Cincinnati, Ohio

Nailing Machines

Yates ARE NOW Yates

Made Right—Right in Canada

by the

P. B. Yates Machine Co. Ltd.

We are offering the trade a Nailer of the latest accepted design and construction, built of the best obtainable materials by skilled Canadian workmen, at prices that will be favorable to the many users of this type of machine, and we respectfully solicit your enquiries.

P. B. Yates Machine Co. Ltd.

Hamilton - Canada

Suppose You Were Making a Very Fine Period Suite, or Perhaps a Phonograph Period Model

This sort of a piece absolutely deserves trimming that is attractive and correct

LET US SEND SAMPLES

F2-4141

WRITE FOR PRICES

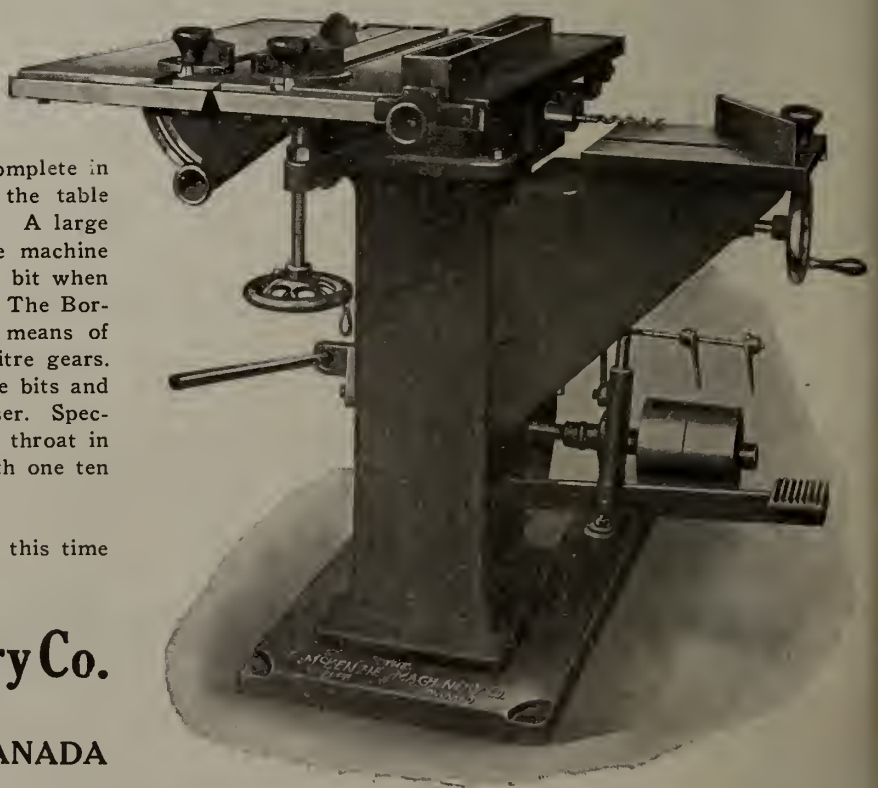
WE MAKE IT—and everything else in the Hardware line

WEBER-KNAPP CO., Jamestown, N.Y.

The Handiest Machine on the Market

The Split-tilting table (Patent Applied For) can be tilted and locked at any angle up to forty-five degrees as indicated on the graduated segment. This machine is also supplied with a solid table. The Boring Attachment is very complete in itself. A foot lever is connected with the table which slides back and forth on the knee. A large coil spring located in the column of the machine automatically releases the work from the bit when pressure is removed from the foot lever. The Boring Attachment is raised or lowered by means of a handwheel connected with a pair of mitre gears. The spindle is bored to take standard size bits and can be arranged for a hollow chisel mortiser. Special cutters may be used by removing the throat in the table. Each machine is furnished with one ten inch saw, belt and wrench.

Write for prices and pamphlet describing this time and labor saver more fully.



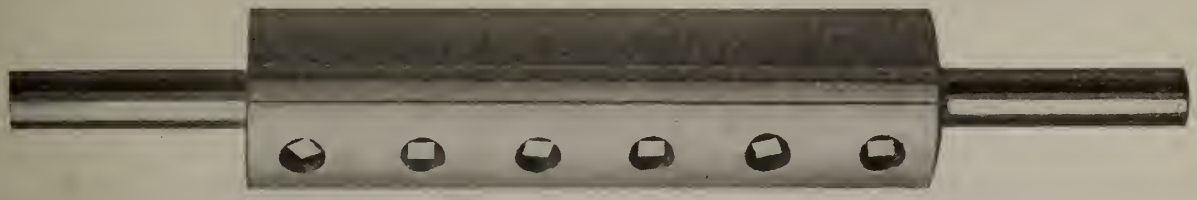
Cross-cut Mitre & Rip Saw Machine showing Split-Tilting Table & Boring Attachment

D. McKenzie Machinery Co.

MANUFACTURERS

GUELPH, ONT. CANADA

The Shimer Round Safety Cylinder with High Speed Knives



A Round Safety Cylinder that will Appeal to the Buyer and the User for three Reasons:

The first is our adjusting nut for setting the knives. It is the only cylinder with properly located adjusting nuts for setting the knives, which, with our way, can be set to 1-1000 of an inch.

The second is our way of holding the knife without tapping into the head.

The third is the correct angle of cut for the knives.

Made for Any of the Different Makers' Machines and in Any Length Cylinder.

WRITE FOR PRICES

SHIMER CUTTER HEAD CO. OF CANADA, LIMITED

Manufacturers of Cutter Heads, Safety Cylinders and Grinders

GALT, ONTARIO

The Mereen-Johnson Resaw

has many features of advantage which place it far ahead of anything in the Resaw field.

No pulleys—no belts—no frictions.

The sprocket and chain arrangement for changing speeds is only one of the many improvements on this machine.

Write for circular.

Mereen-Johnson Machine Co.

Minneapolis - Minnesota, U.S.A.

SPECIAL DRY STOCK

60,000 ft. 5/4 Basswood
400,000 ft. 4/4 Birch Selects & No. 1 Common
200,000 ft. 8/4 Birch No. 1 C & B
200,000 ft. 16/4 Birch No. 1 C & B 12" average.

EDWARD CLARK & SONS LIMITED

807-9 BANK OF HAMILTON BUILDING - TORONTO, Ontario

SOUTHERN HARDWOODS

Dry Lumber in Buffalo for Quick Shipment

WHITE ASH

	1&2	Clear Strips	No. 1 Com.	No. 2 Com.
¾ in.	675	.....	2,100	1,800
1 in.	8,000	330	1,000	34,000
1¼ in.	120,000	4,500	120,000	22,000
1½ in.	16,900	800	43,000	71,000
2 in.	33,300	500	91,000	96,000
2½ in.	42,500	.....	51,000	37,500
3 in.	64,500	.....	24,500	38,500
4 in.	14,000	.....	14,000	10,500

TENNESSEE SCENTED CEDAR

1 in.	92,700'	No. 1 Com. & Btr.
1¼ in.	5,000'	

CHERRY

	1&2	Clear Strips	No. 1 Com.	No. 2 Com.
1 in.	157,500	200	182,200	128,500
1¼ in.	3,500	.....	21,600	2,500
1½ in.	10,000	.....	37,700	26,300
2 in.	7,000	.....	21,200	64,900
2½ in.	6,500	.....	3,700	2,200
3 in.	28,700	.....	3,500	3,300
4 in.	5,900	.....	.....	500

CHESTNUT

	1&2	Clear Strips	No. 1 Com.	S.W.& No. 2 Com.
¾ in.	1,000	.....	51,000	103,000
1 in.	.....	665	4,300	163,500
1¼ in.	171,800	300	89,200	199,200
1½ in.	51,500	.....	52,000	.....
2 in.	22,200	.....	17,300	126,200
2½ in.	4,000	.....	1,500	500
3 in.	2,100	.....	1,300	500
4 in.	1,500	.....	300	.....

CYPRESS

	1&2	Select	No. 1 Shop
1 in.	.....	.....	.....
1¼ in.	.....	8,800	.....
1½ in.	14,100	2,200	18,000
2 in.	2,000	.....	3,600
2½ in.	8,000	.....	.....
3 in.	69,400	23,100	12,000
4 in.	7,300	.....	.....

PLAIN RED GUM

	1&2	No. 1 Com.	No. 2 Com.
1 in.	25,300	13,000	15,500
1¼ in.	.....	325	.....
1½ in.	.....	4,300	9,500
2 in.	.....	.....	7,500

FIGURED RED GUM

	1&2	No. 1C
1 in.	7,800	700

QUARTERED RED GUM

	1&2	No. 1C	No. 2C
4/4	6,000	20,000	12,100
5/4	5,100	3,800	.....
6/4	3,900	4,500	.....
8/4	19,100	7,500	3,600

SAP GUM

	1&2	No. 1 Com.	No. 2 Com.
1 in.	3,400	6,000	200
1¼ in.	.....	400	.....
1½ in.	2,400	6,000	13,500
2 in.	.....	5,700	10,400
2½ in.	.....	.....	.....

QUARTERED SAP GUM

	1&2	No. 1C	No. 2C
4/4	.....	2,500	12,000
5/4	14,000	.....	.....
8/4	2,000	.....	.....
10/4	350	24,000	3,000

HICKORY

	1&2	No. 1 Com.	No. 2 Com.
1 in.	2,200	2,400	11,600
1¼ in.	500	1,500	2,050
1½ in.	3,600	9,300	25,000
2 in.	.....	20,200	16,200
2½ in.	7,000	13,000	5,700
3 in.	3,500	8,580	7,200
4 in.	600	400	375

PLAIN WHITE OAK

	1&2	Clear Strips	No. 1 Com.	No. 2 Com.
5/8 in.	10,150	.....	500	16,900
¾ in.	142,900	.....	251,000	83,000
1 in.	16,300	1,700	129,000	85,200
1¼ in.	28,300	.....	4,500	5,000
1½ in.	111,500	.....	72,000	18,000
2 in.	94,000	.....	131,000	65,000
2½ in.	176,800	.....	56,500	3,000
3 in.	106,800	.....	65,800	14,400
3½ in.	5,500	.....	3,000	1,500
4 in.	77,000	.....	22,500	6,000

PLAIN RED OAK

3/8 in.	24,200	.....	.....
¾ in.	104,000	.....	121,000	33,200
5/8 in.	.....	.....	84,000	53,600
1 in.	95,200	3,550	133,000	142,400
1¼ in.	90,700	2,400	13,000	.....
1½ in.	168,900	4,300	68,200	40,000
2 in.	148,100	.....	180,800	71,000
2½ in	78,100	.....	24,000	3,700
3 in.	28,800	.....	20,500	7,000
4 in.	18,600	.....	8,900	.....

Also Large Stocks of Ash, Basswood, Beech, Birch, Hard and Soft Maple.

THE ATLANTIC LUMBER CO., 310 Manning Chambers, Toronto

MANUFACTURERS SOUTHERN HARDWOOD LUMBER

Yards: BUFFALO, N.Y. Mills: KNOXVILLE, TENN.; FONDE, KENTUCKY

The London Lumber Co. Ltd.

WHOLESALE LUMBER

Will make attractive prices for 4/4 Birch and Elm; immediate shipment. Also have good stock in all thicknesses, Soft & Hard Maple, Ash, and Basswood. Write us for quotations.

487½ Richmond St. London, Ont.

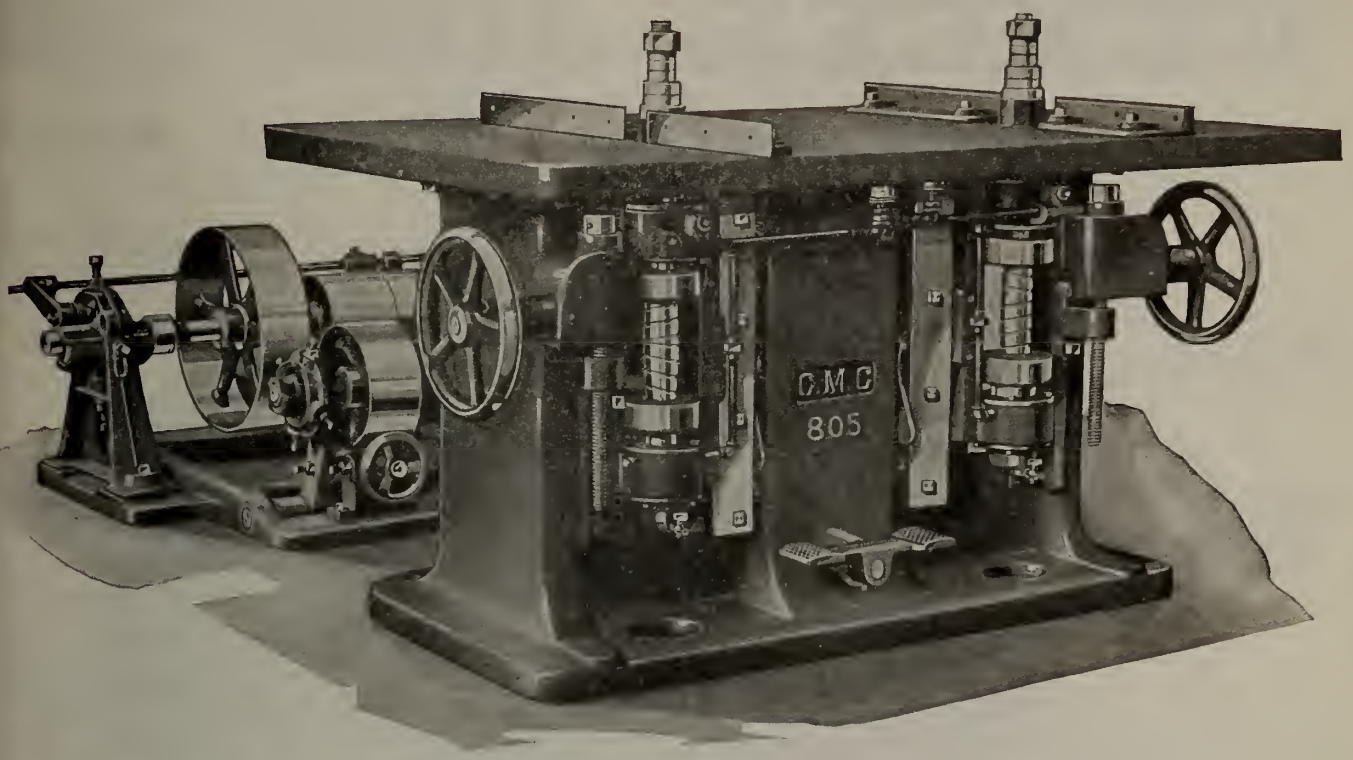
The Bacon Lumber Co.

HARDWOODS:

OHIO and INDIANA
KENTUCKY and WEST VIRGINIA
NORTHERN BIRCH and MAPLE
SOUTHERN GUM, COTTONWOOD

306 Ulmer Bldg., Cleveland, Ohio

NEW SPEEDY ACCURATE



C.M.C. NO. 805 High Speed Ball Bearing Shaper

8,000 R. P. M.

A Shaper, developed and built by men with long experience in their line, this machine embodies the latest and most up to date features. It is a heavy substantial machine which will handle all classes of shaping and will produce large quantities of the finest work speedily and economically.

FULL PARTICULARS AND PRICES ON REQUEST

CANADA MACHINERY CORPORATION, GALT, ONTARIO
LIMITED

Toronto Sales Office - 721 Bank of Hamilton Building.

The only

VENEER JOINTER

that will effectively joint buckled veneer

No. 181 "Preston" Veneer Jointer

THIS MACHINE was designed and built for the purpose of making commercially perfect face joints butt or crosswise as well as lengthwise of the grain on the highest figured circassian walnut or crotch mahogany veneer.

One of the most essential features of a machine of this kind is RIGIDITY. Examination of the frame or column on above illustration will show the massive construction of same which is of cored section and cast in one solid piece. This guarantees absolute accuracy in the table Vee ways at all times, thus contributing to a perfect joint being made on straight or curly stock at one operation.

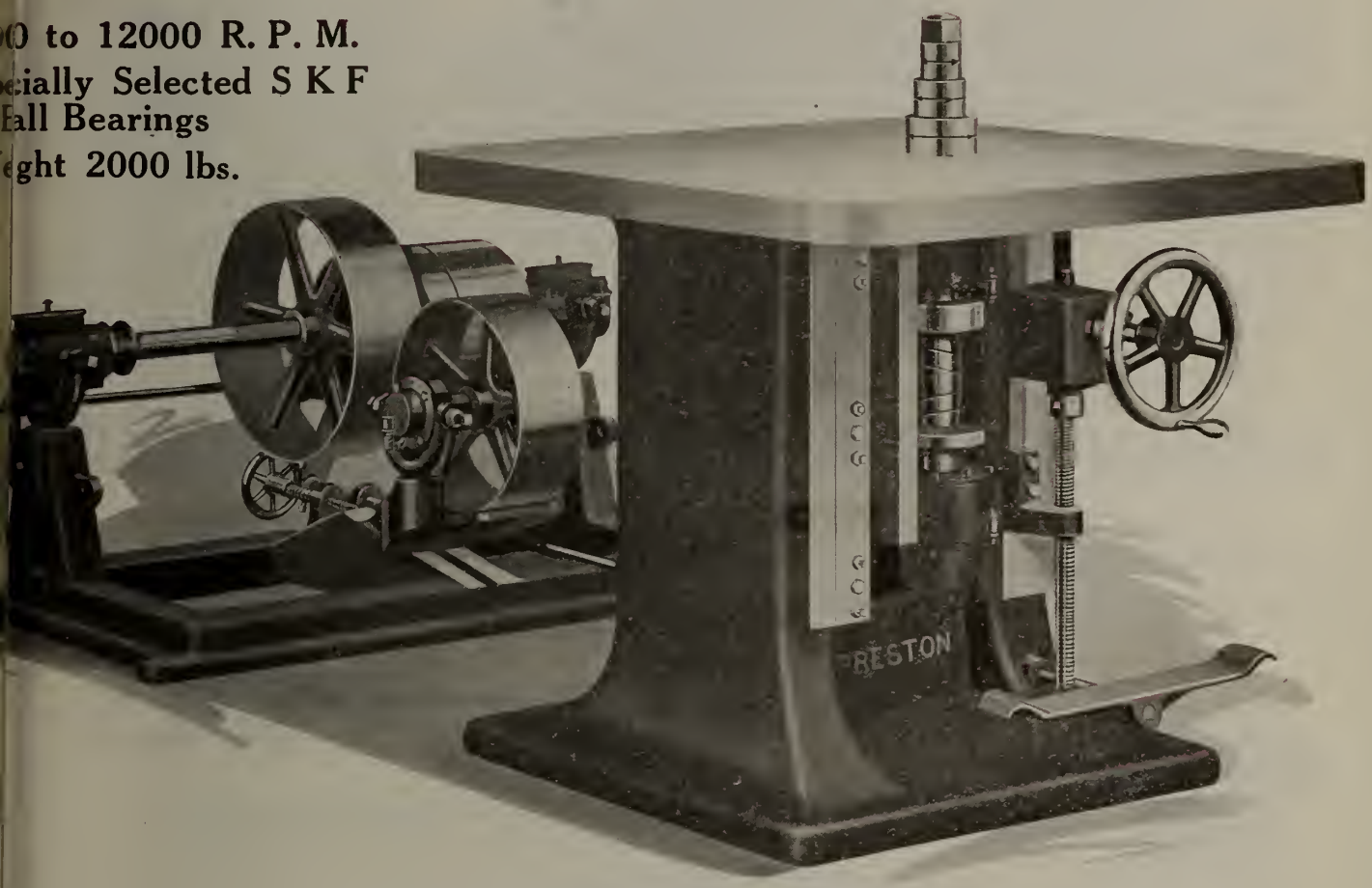
The Preston Woodworking

We are the Sole Manufacturers and Agents in Canada of the Eaglesfield Patented Beltless Swing Saw—See advertisement page 17.

Don't Waste Time

by having a shaper in your plant which is not 100% efficient

0 to 12000 R. P. M.
ially Selected S K F
all Bearings
ght 2000 lbs.



Cut showing machine with single spindle

Preston" No. 162 High Speed Ball Bearing Shaper

Built with either one or two spindles

It may be that now when things are a bit slack is the best time to arrange and re-arrange your plant to receive the maximum of efficiency from both men and machines. If we can be of any assistance in helping you plan or suggest means by which this can most economically be arranged, write us.

Machinery Company, Ltd.

PRESTON, ONTARIO

COWAN WOOD TOOLS are the BEST

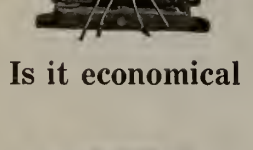
POWER FEED RIP SAW 280

Variable Feed. Large Table. Simple, Strong, Compact.
Feed Works and Table both adjust by Hand Wheels.
Adjustable for Short or Long Stock. Feeds Stock 6" Thick.

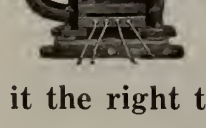
COWAN & COMPANY OF GALT LIMITED

GALT - ONTARIO

Is it economical ?



Is it the right type ?



Is it the right size ?

THREE GUESSES

Electric power, heating, lighting and equipment problems are to be found in the woodworking industry.

Perhaps your output can be increased? You are, perhaps, losing electrical energy by wasteful types of motors? Are your switches and wiring devices up-to-date or are you in continual danger of fire?

We shall be pleased to answer any questions or help you with any problems whenever you care to write us.

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Please send the "Electrical News" to the undersigned until further notice, for which find enclosed Two Dollars, being One Year's Subscription in advance.

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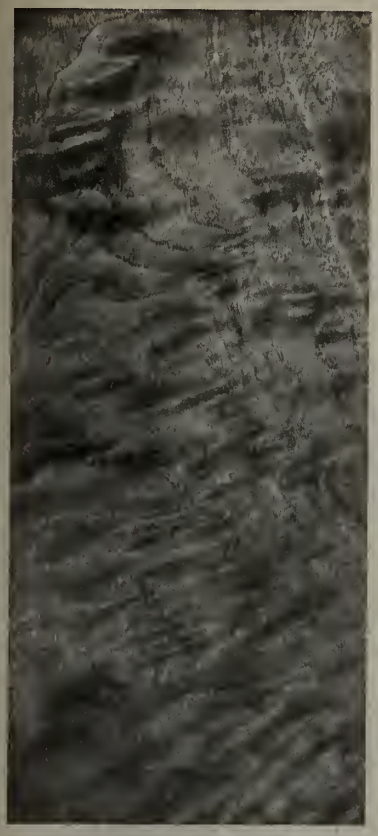
Address .....



Panel Veneer in Exceptionally Fine Figuring

Beautiful

BLACK WALNUT

Virginia Timber

Choice Stock for Floor Lamps and Candle Sticks.

FRANK R. PORTER

WASHINGTON, D.C., U.S.A.

Saw, Veneer and Export Logs

"The Kiln Drying of Lumber"

A Practical and Theoretical Treatise

By HARRY DONALD TIEMANN, M.E., M.F.

In charge, Section of Timber Physics and Kiln Drying Experiments of the U. S. Forest Service. Special Lecturer in Wood Technology and Forestry, University of Wisconsin. Forest Products Laboratory, Madison, Wisconsin.

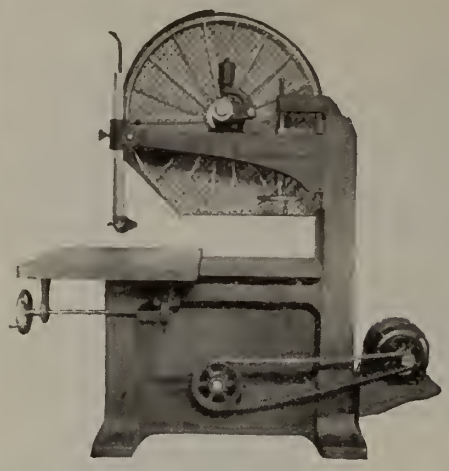
Second Edition 318 pages.

The value of a technical knowledge of *kiln drying* is self evident. This book, as does no other upon the market, gives the reader the most recent and most clearly expressed information. The text and illustrations guide the way to the most efficient methods of work.

Price $5.00

Woodworker Publishing Co., Limited

345 Adelaide Street West, Toronto



THE VERY BEST

West Side Iron Works

Factory: GRAND RAPIDS
General Offices: CHICAGO

West Side

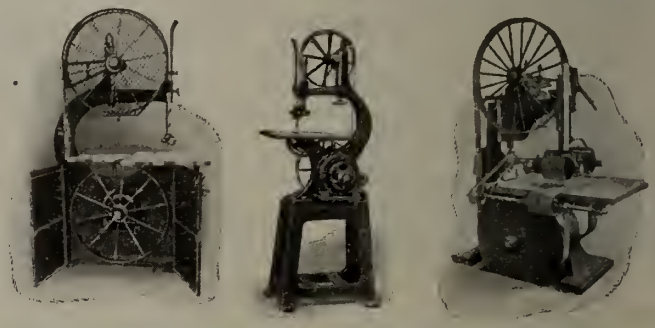
Band Saws for these reasons:

To operate a West Side band saw—or even to see one—is to realize what careful experienced designing means to machines of this character. Most convenient of operation: uncommonly strong.

We build band saws of convenience and capacity, each model with choice of **three drives:** direct motor—belt—gear.

MOTOR DRIVEN BALL BEARING No. 78

—illustration to the left is of our 42-in. straight column frame band saw possessing important superiorities. Trus-running; perfectly balanced; improved work table for quick, accurate angle work. Ask for full information.

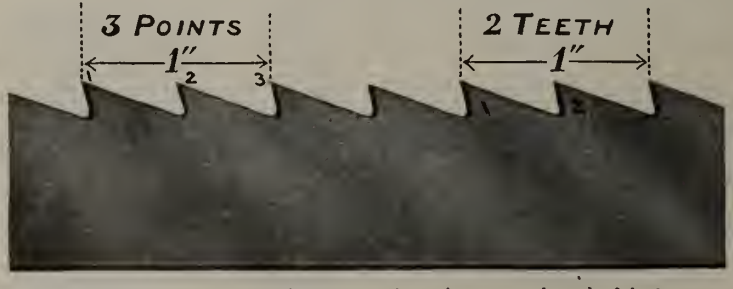


Speed Up the Work

No Breakdowns - No Delays

With

"BEAVER" BAND-SAWS



NOTE—When measuring points count the points at each end of inch, as per illustration. 3 points are two teeth, etc.

When there is a big cutting job ahead in the sawmill, box factory or woodworking shop, RADCLIFF SAWS are the ones to rely on. They will give you the greatest satisfaction.

BEAVER BAND-SAWS are made from the highest grade Swedish Crucible Steel—keen-cutting and strong. Let us send you particulars and prices.

Radcliff Saw Manufacturing Company, Limited

1550 Dundas Street West TORONTO, ONT.

AGENTS FOR L. & I. J. WHITE CO., MACHINE KNIVES

Will do the work of Five Hand Jointers in making Glue Joints

This is the guarantee given with our

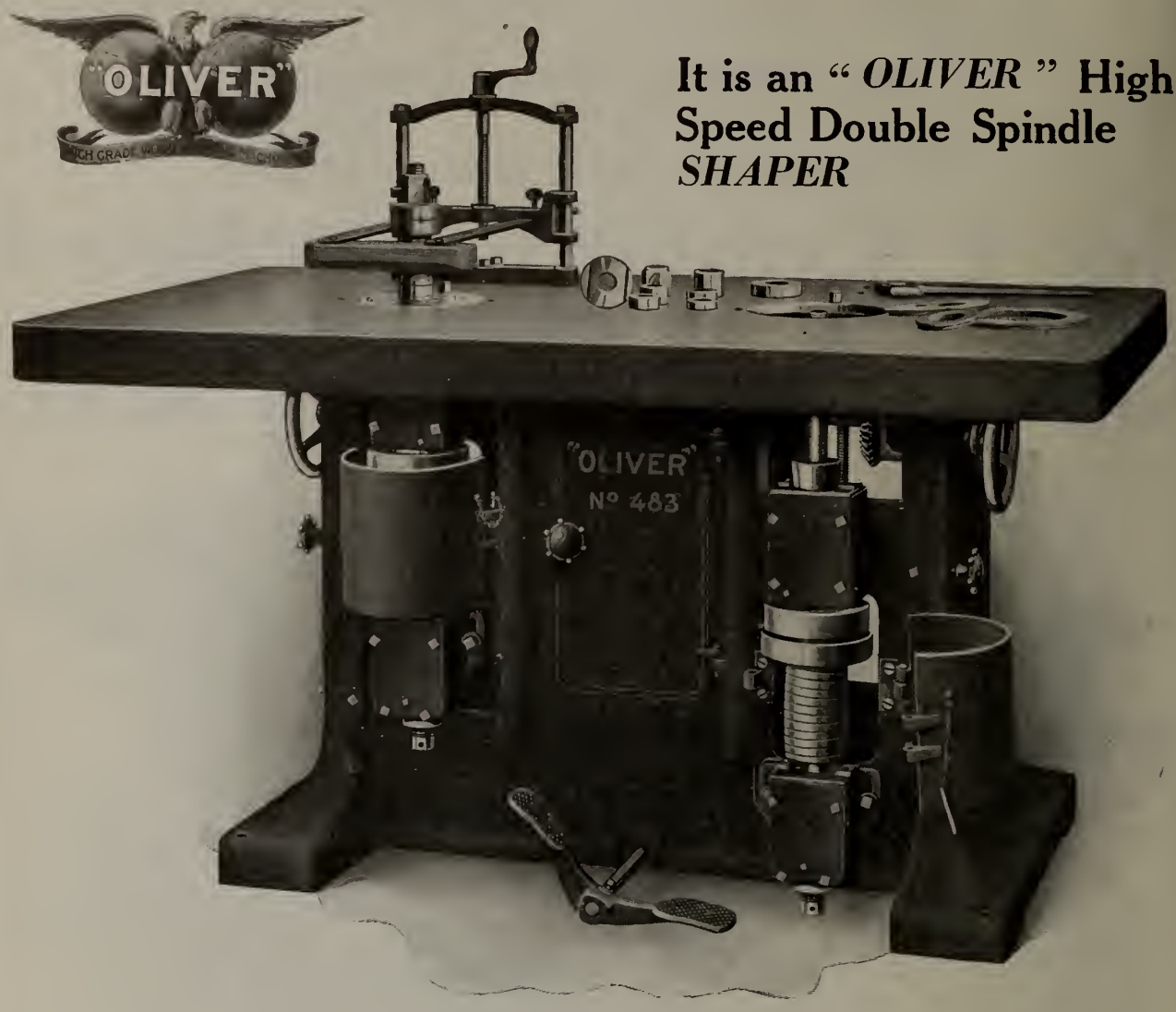
No. 4 Continuous Feed GLUE JOINTER

Strongest and most complete machine on the market.
Any part may be readily removed or renewed.
Feeds in opposite direction, giving 100 feet per minute.
Works material from six inches up to any length desired.
Also from one quarter to 3 inches thick, and from three-quarters of an inch wide up to any width.
1 set Shimer Special Jointer Heads supplied with machine.

Investigate the merits of this machine—it will pay you!

Jackson, Cochrane & Company

KITCHENER - CANADA



It is an "*OLIVER*" High Speed Double Spindle *SHAPER*

It is simple in design; powerful in action; durable in operation; second to none; leader of many. The forced self-oiling Ball Bearings permit of very high speeds and quantity as well as quality of output.

Send for particulars of the Shaper and also the Universal Motor Drive applicable to any Double Spindle Shaper. This drive consists of floor plate supporting two vertical columns, each independently adjustable and each bearing a standard vertical 3400 RPM motor.

Oliver Machinery Company

Grand Rapids, Mich., U. S. A.

Eaglesfield "BELTLESS" SWING SAW

Announcing——

A new design with special high-torque small-diameter

MOTOR DIRECT ON ARBOR

In addition to the present type of EAGLESFIELD BELTLESS SWING SAW, motor gear-connected, which was put on the market in 1919, we now announce a new design, with motor mounted directly on 2-in. spindle—gears entirely eliminated.

With ample power for saws up to 24-in., this new design permits a range of cutting from the small shop requirements up to heavy-duty service in car shops and saw mills.

Motor connection takes up only 3½ in. of saw, leaving ample clearance—as on a 24-in. saw, 8¼-in. cutting surface is available. Saw can be trammed for more accurate cutting than you have been accustomed to.

The unified hanger construction, resilient spring action, and the 7-in. section column are identical with the gear-head machine.

Motor is of the enclosed, built-in type, 25 or 60-cycle, 2 or 3 phase, any voltage. Extra large size S K F ball bearings. Saw up to 24-in. included in equipment.

Made in Canada

Preston Woodworking Machinery Co.
PRESTON - ONTARIO

R. D. EAGLESFIELD
22nd St. and Northwestern Ave. INDIANAPOLIS, IND.

Have You a Circular of the Eaglesfield "BELTLESS" TILTING ARBOR SAW

"Every board you use has to be cut off"

MIL PIPING

Shaving and Sawdust Collecting Systems Installed Complete

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Neville-Cooper Co.
130 Ontario St. Toronto
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We also manufacture and erect Smoke Stacks, Boiler Breechings, Metal Cornices, Skylights, Eavetrough, etc.

"CASCO" Waterproof Glue

Mixed Cold—Used Cold

Simple to prepare—can be applied with your present equipment. Comparative tests have convinced thousands of manufacturers of the merits of "CASCO" for jointing and veneering, both from the standpoint of quality and cost. Why not let us tell you about it?

The Casein Manufacturing Co.
Manufacturers of Casein Glues for twenty-five years
15 PARK ROW NEW YORK CITY
NOTE. Send for Casco Red Book. It contains much information on glue, veneer and panels.

Efficient and Economical

Manufacturing plants and woodworkers seeking the most efficient and economical method of glue handling should investigate

"INTERNATIONAL" Electric Glue Heaters

Constructed of heavy spun copper, no seams. Portable—fit any lamp socket. Give uniform working temperature. Operate on less current than any other electric glue heater.

Write for illustrated folder "Correct Temperature in the Glue Room," and quotations on International Heater sizes one pint to 50 gallons.

INTERNATIONAL ELECTRIC COMPANY
MANUFACTURERS
ELECTRICAL HEATING APPLIANCES
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Canadian Distributors
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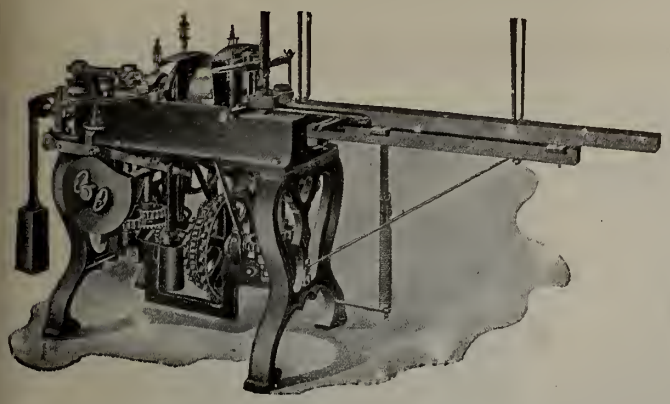
"International Electric Heaters are Better."



Make More Money

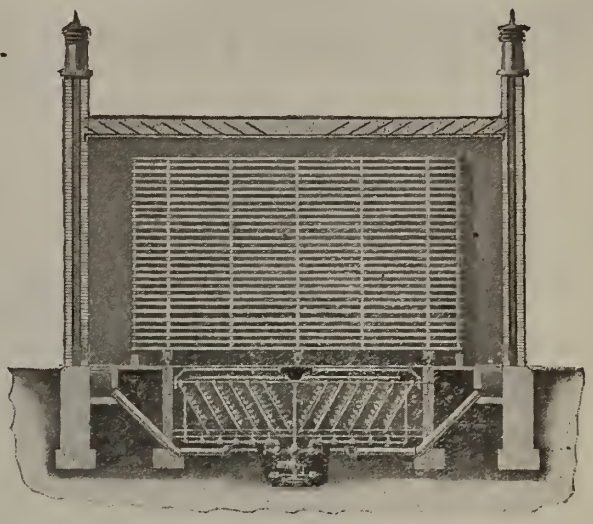
by working your timber into HANDLES and other turned work.

We build machines for making Handles of various kinds, Whiffletrees, Neckyokes, Ball Bats, Spindles, Flag Poles, Vienna Chair Bows, etc. Lathes, Sanders, etc.

Write for complete information and free catalogue No. 31

THE OBER MFG. CO.
CHAGRIN FALLS. O., U.S.A.

Thermo-Myst System



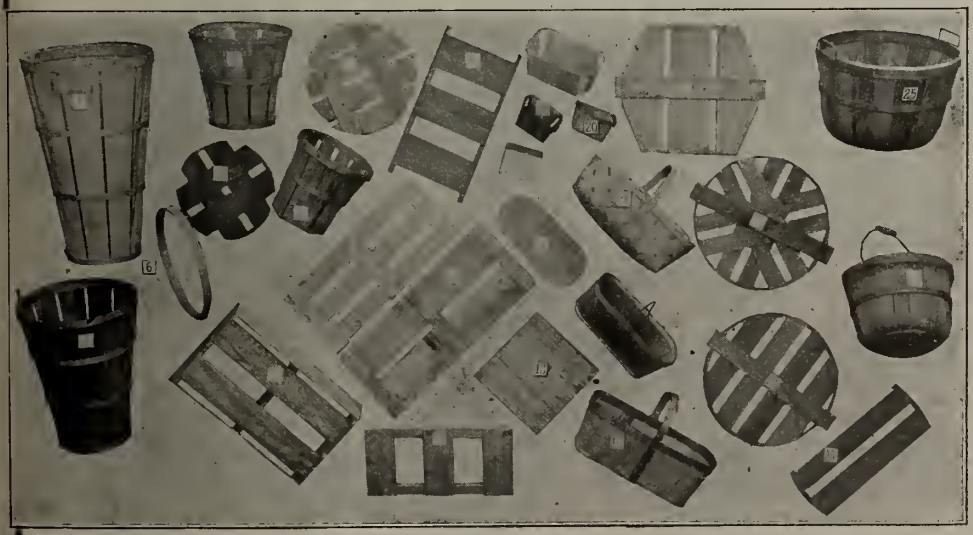
BEFORE YOU BUILD

DRY KILNS

Investigate the merits of our system. Catalog and layouts mailed on request.

Curtis-Hosey Dryer Co. of Canada
177-179 Duke Street, MONTREAL, P.Q.

THIS IS THE NAME



of the Machinery for the Rapid Production of

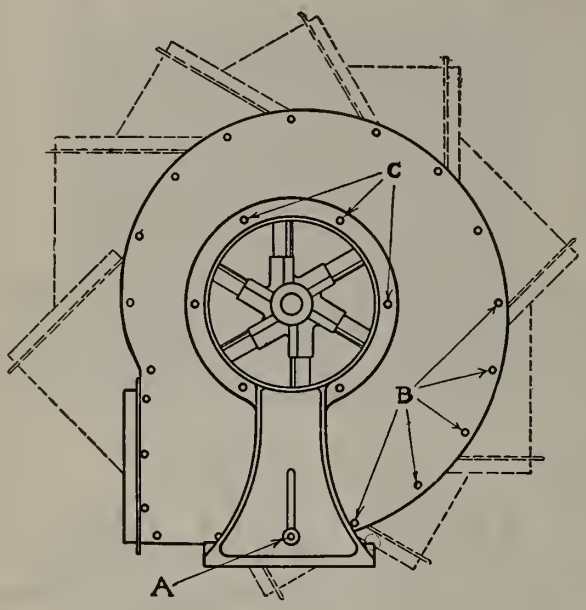
Veneer—Crates—
Baskets—Fruit Packages.

"St Joe"

Get the name fixed in your mind.

ST. JOSEPH IRON WORKS, St. Joseph, Michigan

Reversible Housing



One of the features of the Canadian Planing Mill Exhauster is the reversible housing. It is easily adjustable to either hand and to any discharge.

By this arrangement one fan may be used to meet all requirements, thus eliminating crossed belts and sharp angles.

Let our engineering department help you plan your refuse exhauster system.

Write for catalogue 400-13.

Canadian Blower & Forge Co.
KITCHENER, ONT.

The Productimeter

A real lumber meter of extremely substantial construction, making it more than equal to the hard usage to which it is sure to be subjected in wood-working plants.

For use on moulders, matchers, stickers, flooring machines, and self-feed rip saws.

Other designs for other machines. Mention the machine whose output you want to count, or measure, and we will send you the right Productimeter for a 30 days' trial.

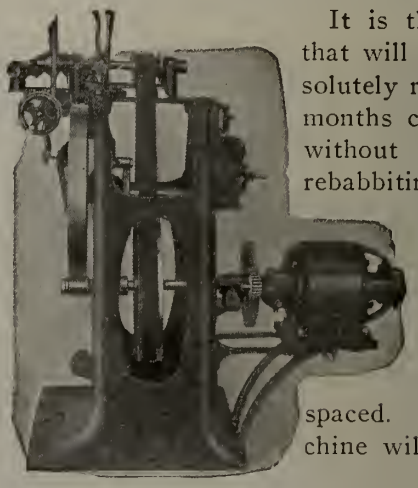
Get our complete Catalog

The Durant Manufacturing Co.
615 Buffum St. MILWAUKEE, WIS.

The Berry Combination Band and Circular Automatic Saw Sharpener

Belt or Motor Driven. Capacity: Bands, 3-16" to 4", Circulars 4" to 32". Simple, Universal, Automatic in Action.

It is the only *combination* grinder that is *automatic*



It is the only grinder that will grind a saw absolutely round after three months continuous use—without readjustment or rebabbiting. It will take an unevenly spaced, hand-filed saw and make it perfectly round and even spaced. No other machine will do this.

For All Shops Using Circular or Band Saws

The Berry Tooth is far superior to the ordinary peg tooth. All teeth are alike, evenly spaced—ground right from the center. A saw ground with this machine does twice the work in half the time.

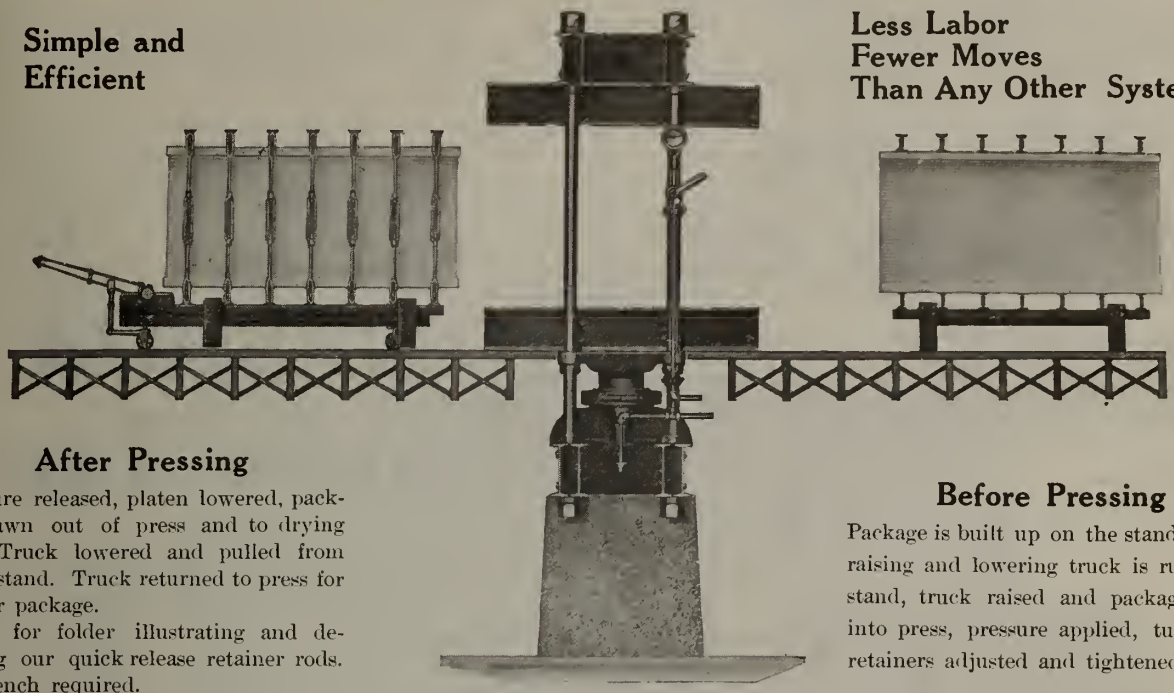
Write for Booklet to-day.

O. V. HOOKER & SON
St. Johnsbury Vermont

The Van Atta System of Veneer Package Pressing & Handling

Simple and Efficient

Less Labor Fewer Moves Than Any Other System



After Pressing

Pressure released, platen lowered, package drawn out of press and to drying floor. Truck lowered and pulled from under stand. Truck returned to press for another package.

Write for folder illustrating and describing our quick release retainer rods. No wrench required.

Before Pressing

Package is built up on the stand. Special raising and lowering truck is run under stand, truck raised and package drawn into press, pressure applied, turnbuckle retainers adjusted and tightened.

E. B. VAN ATTA & CO., Inc.
Manufacturers of Hydraulic Presses and Pumps
OLEAN, N. Y.

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Fader Machinery Co., Inc.
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Mechanical Leathers

Rawhide BELTING *Krome*

for high speed and high power

Round, Flat and Twist

oil, moisture & friction proof

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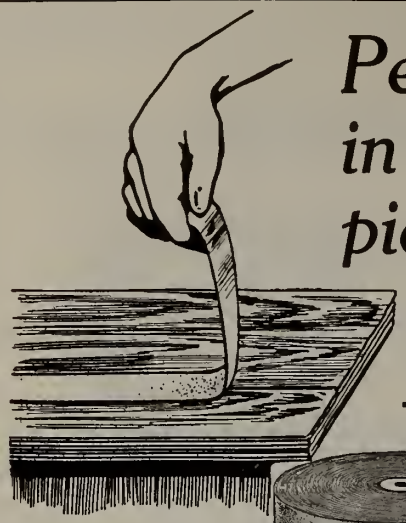
Rawhide Gears and pinions
Grain Leathers - Imitation Leathers

MECHANICAL LEATHERS LIMITED
126 Garden Avenue, Toronto
Canadian Representatives — Chicago Rawhide Manufacturing Company

If made of hide for mechanical purposes we have it



Peels off in one piece

An Innovation for Veneer Manufacturers

Save Time
Save Labor

Magic Veneer Tape

Made of Special Troy Kraft Paper, heavily gummed, insuring instantaneous adhesion. After soaking, it can be easily pulled off in one piece, eliminating the necessity for sanding and scraping which other methods incur.

Write for sample coil and prices.

We also manufacture cloth veneer tapes, samples of which we will be pleased to mail you upon request.

The
Gummed Products Co.
TROY **OHIO**

CANADIAN · NASHUA · PAPER · CO · LTD
SERVICE INNOVATION QUALITY
TRADE MARK
PETERBOROUGH ONT.

NASHUA Veneer Tapes

Are manufactured with a view to giving the consumer the material for his purpose, and we stand ready to develop any special requirement for you.

In purchasing our tapes you are assured of prompt, **service** guaranteed **quality** and a reasonable **price.**

Samples of our stock will be sent upon request, so that you may try them out in your plant in a practical way.

CLOTH and PAPER
Guaranteed Veneer Tapes

THE CANADIAN NASHUA PAPER CO., Ltd.
Peterborough, Ont.

Perkins Vegetable Glue

PERKINS 183 was the FIRST VEGETABLE GLUE ever sold to high grade woodworking concerns and PERKINS 183 is now the last word to be said of a HIGH GRADE, UNIFORM QUALITY GLUE. Much money and effort have been spent on work covering a period of years; many changes were made in the formula until the present manufacturing process of 183 was reached and for fourteen years this glue has successfully filled the requirements of HIGH CLASS GLUE. Both our research and factory laboratories are constantly working to improve manufacturing methods and we shall never be satisfied to give the trade anything less than the best.

The Home of

PERKINS 183

TRADE MARK (Reg. U.S. Pat. Off.)

Our Canadian Factory is located at Hamilton, Ont.

Process and Product Patents covering Perkins Glue were granted July 2nd and March 19th, 1912, and have been held valid and infringed by the United States Circuit Court of Appeals. Patents have also been granted in Canada, Great Britain, Germany, France, Belgium, Italy and other foreign countries.

Quick Repair

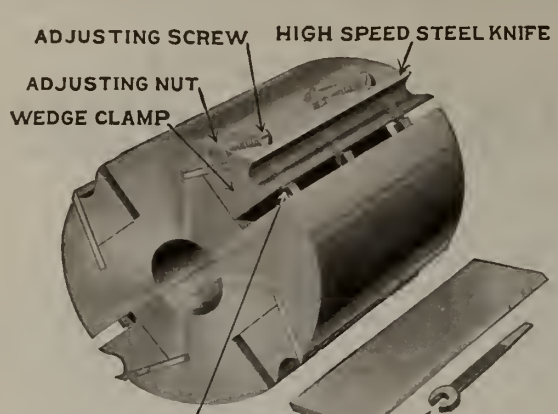
For repairing splits, checks and other defects in face veneers. Made in colors to meet the requirements of the best finishes of all cabinet woods.

Put up in tubes for convenient use on surface stock and in quart cans for larger defects in core stock.

PERKINS GLUE COMPANY

Factory and General Offices:
Lansdale, Pennsylvania

Sales Office:
South Bend, Indiana



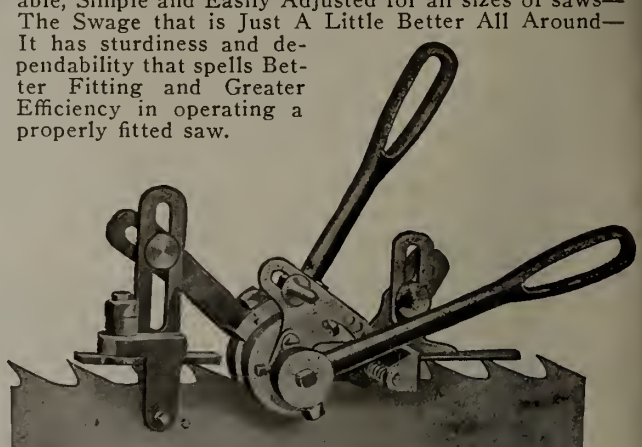
The PORTER "C" Slip-on-Head for Shapers, Jointers and Moulders will cut straight or cross grain without tearing. Irregular shaped knives can be used as well.

There are over 3,000 of these Heads in daily use.
Write for circular and quotation.

C. O. Porter Machinery Co.
GRAND RAPIDS, MICHIGAN, U.S.A.

Quality Higher--Price Lower

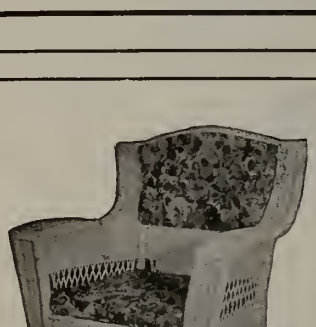
The construction of the Crowell Swage is the secret of CROWELL SUPERIORITY—Right Design, Reliable, Simple and Easily Adjusted for all sizes of saws—The Swage that is Just A Little Better All Around—It has sturdiness and dependability that spells Better Fitting and Greater Efficiency in operating a properly fitted saw.



D. J. CROWELL
61 TERRACE, BUFFALO, N.Y., U.S.A.

Canadian checks accepted at PAR

All Crowell Swages reduced to pre-war prices



Courtesy Kelton-Aurand Mfg. Co.

Art Fibre

Art-Fibre is all that its name implies. Spun from the finest quality of sulphite stock, its smooth uniform surface produces results when properly finished, that correlates with the most artistic designs and the finest quality of upholstering materials.

Because of its known reliability, economy, and excellent quality ART FIBRE SERVES BEST.

Samples and prices sent upon request.

GRAND RAPIDS FIBRE CORD CO.
Grand Rapids, Michigan

An Efemco Product

The Metal Bed Caster with four-point contact for RIGIDITY

This new EFEMCO CASTER fits both square and round post tubing. Inserted in the post, its powerful spring expands, forming a four-point interior contact with the walls, which holds it upright. The grooved portion forms a perfect bearing, allowing the caster to turn freely. These exclusive EFEMCO features make for better metal beds -- or iron cots.

We can supply this caster in the ball or roller-bearing types. Up to 1½ inch sizes it is finished with cupped washers. Above that size with leg mounts.

Made to fit tubes of the following sizes in iron pipe—⅞", 1", 1 1/16" 1¼" and 1½". Round tubing—1½", 1 9/10", 2", 2½" and 3". Square—1½", 2", and 2½".

We can supply this caster with maple, lignum-vitae, steel, iron or fibre wheels. It's a genuine EFEMCO Product and of the usual EFEMCO quality and dependability.

Write for catalog showing new lines of improved Efemco Casters.

FOSTER, MERRIAM & CO.

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Grip Neck Casters
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Standardized by 86 years of service

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A few of the

EXCEPTIONAL BARGAINS

appearing in our regular Monthly Woodworking Machinery List, are as follows:—

If It's Machinery—Write "WILLIAMS"

No. 51252	7½' Taylor Clamp Carrier, 40 sections, 160 clamps. Practically new.
42325	Baker Bros. Dowel Machine, 2½", used.
50950	Preston Veneer Taping Machine, 36", used.
50577	No. 155 Jackson Cochrane Band Rip and Edging Saw, used
51162	36" Preston Band Saw, new.
51129	42" McGregor Gourlay Band Rip Saw, used.
50944	Preston High Speed Ballbearing Shaper, slightly used.
42671	Cowan, M. 93, 2 Spindle Shaper, Iron Table, 42" square, spindles 1" dia. 20" centres, new.
51131	C.M.C. 12" Jointer with round safety cylinder, new.
48850	42" Berlin Invincible 3 Drum Sander, used.
42780	Beach Disc and Drum Sander, new.
48845	New Britain Chain Mortiser, used.
71717	No. 312 Morgan Box Trimming Machine, used.
50659	No. 10 Morgan Nailing Machine, with double row of chucks and clinching device, used.
48629	Meeren-Johnson Boxboard Squeezer, used.
51140	No. 10 Ober Lathe, for turning handles, 1-11/16", new.
51165	No. 4 Waymoth Lathe, with sizing rings, used.
43906	Preston Manual Training Lathe, with motor drive, new.
51176	Yates No. 108 10", 4-side Moulder, used.
50781	Cowan Door Sticker, used
48143	S. A. Woods, 15" x 6 Inside Moulder, used.
51181	Yates 2-G Straight Edge Ripper, with revolving bed, 10" saw, used.
50735	Wood Frame Rip Saw Table, used.
50736	Cowan, No. 208, Boxmaker Rip Saw, used.

Our Monthly List is the largest and most comprehensive list of first-class Woodworking Machinery issued.

THE PRICES ARE RIGHT

The A. R. Williams Machinery Co., Limited

64 FRONT ST. WEST - TORONTO

Phone Woodworking Machinery Dept., Adelaide 20

Full lines of Iron and Wood-Working Machinery, Boilers, Engines and Contractors' Machinery, Electric Motors, Saws, Shingle and Lath Mill Machinery, etc.

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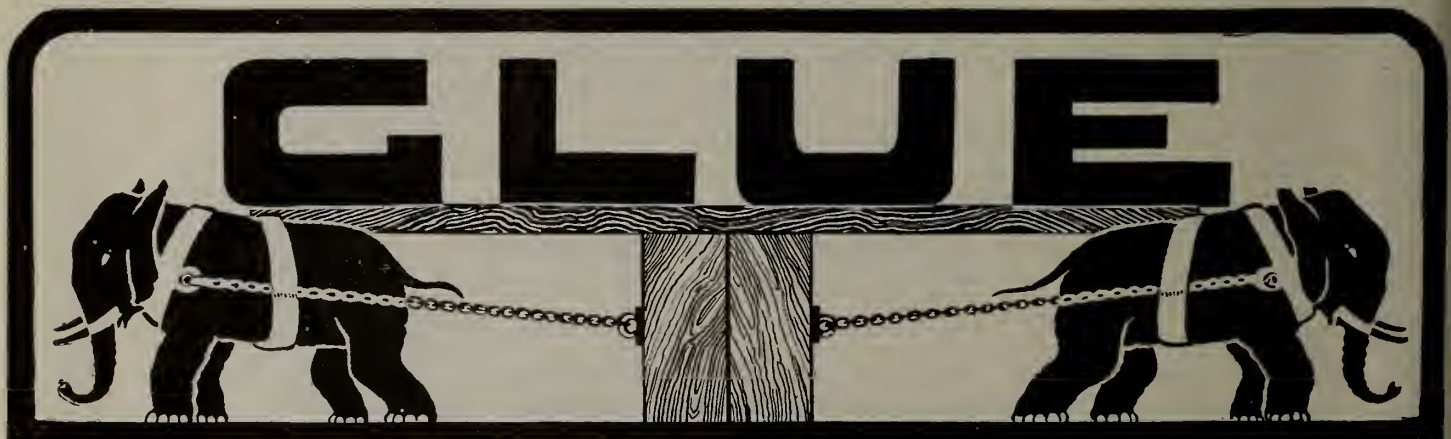

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Suitable for All Climates.
Great Strength & Light Colour.

SAMPSON & WHITE, Ltd.

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In no phase of our business is care more thoughtfully exercised than in the selection and training of men for their places in this organization.

The importance of this will be recognized by those who realize the value of fire prevention work.

Our insurance policy is not only a guarantee of prompt payment of fire loss, but it also carries with it a service that includes a regular fire prevention inspection on your property.

A thorough fire prevention inspection may save your property from destruction, and it will also assist a great deal in accumulating larger savings which will result in better insurance for less money.

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Lee Blakemore, Incorporated

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Glass Paper, Flint Sand Paper, Garnet Paper

IN SHEETS AND ROLLS FOR ALL PURPOSES

Rolls 50 yards long, 18 in., 20 in., 24 in., 30 in., 36 in., 40 in., 42 in. and 48 in., wide

SHEETS, DISCS, STRIPS AND BANDS can be made to Special Sizes to suit the requirements of Purchasers

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BLUE DIAMOND NEENAH

Wood Products

ROTARY CUT SINGLE PLY GUM and POPLAR	DESK and TABLE TOPS in all WOODS	THREE and FIVE PLY PANELS in all WOODS	VENEERED and SOLID DOORS STANDARD and SPECIAL

Manufactured by

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Quality Guaranteed

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REEDS - WASTE - RESIN
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Prompt Shipment

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For Every Need in the Woodworking Industry

Bale ties, Nails and Wire of every description are manufactured by us. We manufacture to your order.

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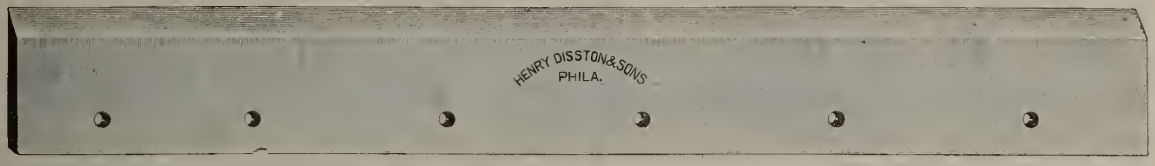
DISSTON

ALL STYLES OF KNIVES FOR WOODWORKERS



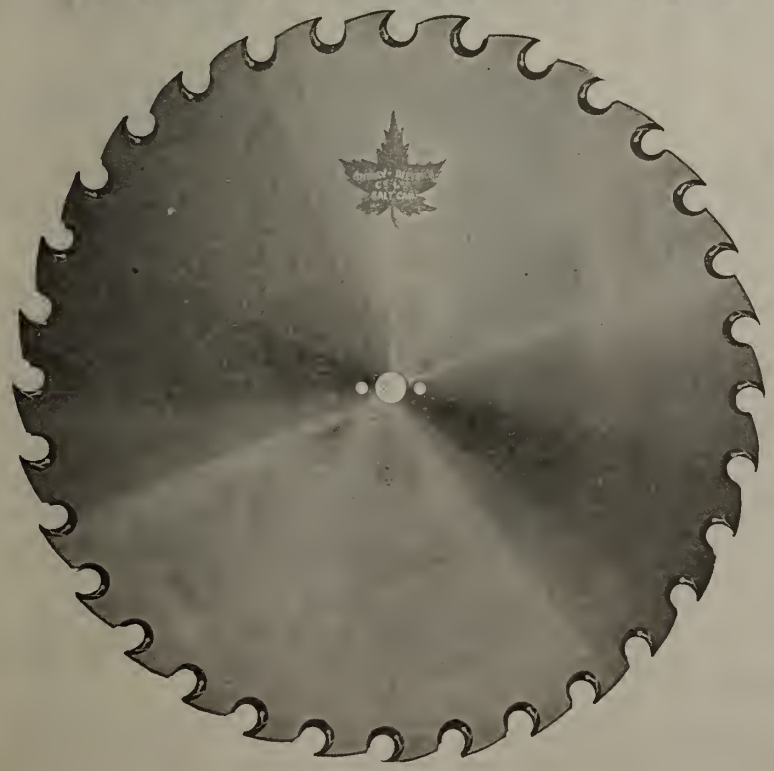
Are you getting the maximum production from your knife equipment? With the present necessity for greatly increased production, be sure your knives will give you the best possible results.

Disston knives cut fast and clean ,and hold their cutting edge.

Write for the Disston booklet on Machine Knives.

HENRY DISSTON & SONS LIMITED
TORONTO CANADA
Branch: Vancouver, B. C.

MAPLE LEAF SAWS



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Lath Saws
Special Grooving Saws
Dado Heads
Band Saws
Cross Cut Saws
Hand Saws
"Crowell" Swages and Shapers

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The McLennan Lumber Co.
Limited

MONTREAL

British Columbia Forest Products
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Montreal

Special Items of Interest
for Prompt Shipment

WHITE ASH			
11,000′	4/4	No. 2 C&B	
BROWN ASH			
60,000′	4/4	No. 1 C&B	
16,000′	6/4	No. 1 C&B	
8,900′	8/4	No. 1 C&B	
BASSWOOD			
75,000′	4/4	Sel. & Fas.	
100,000′	4/4	No. 1 & 2. Com.	
75,000′	6/4	No. 1 Com. & FAS	
50,000′	6/4	No. 2 Com.	
40,000′	8/4	No. 1 C&B	
MAPLE			
75,000′	4/4	Log Run	
BEECH			
65,000′	4/4	Log Run	
BIRCH			
30,000′	4/4	FAS	
90,000′	4/4	No. 1 Com.	
150,000′	4/4	No. 2 Com.	
30,000′	5/4	No. 1 Com. & FAS	
45,000′	6/4	FAS	
60,000′	6/4	No. 1 Com.	
75,000′	6/4	No. 2 Com.	
100,000′	8/4	Sel. & Fas.	
150,000′	8/4	No. 1 Com.	
100,000′	8/4	No. 2 Com.	
75,000′	10/4	Sel. & Fas.	
125,000′	10/4	No. 1 Com.	
250,000′	12/4	Sel. & Fas.	
100,000′	16/4	Sel. & Fas.	
SOFT ELM			
45,000′	4/4	No. 2 C&B	
21,000′	6/4	No. 1 C&B	
22,000′	8/4	No. 1 C&B	
150,000′	4/4	Basswood, Birch, Ash, Elm No. 3 Com. Under National Rules.	

Hardwood Dowels

Plain, Straight and Spiral Grooved

"Canada Wood" dowels are manufactured from high-grade Maple, Birch, Beech or White Oak, uniform in length and nicely pointed, quality guaranteed.

We also manufacture Bailwoods and Variety Turnings in all styles, sizes and descriptions, in the plain, or Enamelled in Black, Natural Wood or Mahogany finishes. Three-eighth in. Maple, Birch and Quarter Cut White Oak Flooring a Specialty. Broom and Mop Handles of every description.

Canada Wood Specialty Co.

Orillia, Ontario

Sawmills at Zebra and Orillia, Ont.
Cable Address: "Special," Orillia, Can.

Anderson, Shreiner & Mawson

Phone Main 1604 WHOLESALE LUMBER 43 Victoria St., TORONTO

Birch, Maple, Elm, Ash and Basswood

Write or "Phone" for Prices. **Mills at South River, Ont.**

We Can Supply

full or mixed cars for immediate shipment. All grades and sizes of

- **Hard & Soft Maple**
- **Rock & Soft Elm**
- **Beech & Birch**
- **Basswood**
- **Hardwood, in 4x4, 4x6, 1" & 2" No. 3 Com.**

Your enquiries are earnestly solicited and your orders will be properly taken care of.

The Pedwell Hardwood Lumber Company

FOOT SPADINA AVE. - TORONTO

Stock on Hand in Kitchener for Immediate Shipment

3,000	ft.	4/4 x 10 in. and up Qt'd White Oak Fas.
12,000	"	4/4 x 6 in. and up Qt'd White Oak Fas.
15,000	"	4/4 x 6 in. and up Qt'd White Oak No. 1 com.
2,680	"	3/4 x 13/17 Sap Gum Fas.
4,700	"	3/4 x 3/12 Sap Gum No. 1 Com.
400	"	5/4 x 6 in. Plain red Gum Fas.
4,000	"	4/4 x 6 in. up Sap Gum No. 1 Com.
5,000	"	8/4 x 6 in. up Qt'd red Gum C. & B.
8,000	"	5/4 x 6 in. Plain White Oak Fas. ... ...
2,000	"	6/4 x 4 in. Plain White Oak No. 1 Com.
15,000	"	6/4 x 6 in. Plain red Oak Fas.
10,000	"	8/4 x 6 in. Plain red Oak Fas.
25,000	"	8/4 x 4 in. Plain red Oak No. 1 Com.
12,000	"	4/4 x 3 in. Tenn. Red Cedar No. 1 C. & B.
25,000	"	8/4 Sound Wormy Chestnut
2,000	"	5/4 Sount Wormy Chestnut
32,000	"	6/4 Sound Wormy Chestnut
5,000	"	4/4 Chestnut No. 1 C. & B.
10,000	"	5/4 Chestnut No. 1 C. & B.
10,000	"	6/4 Chestnut No. 1 C. & B.
43,000	"	4/4 Soft Elm No. 3 C. & B.
1,000	"	4/4 Soft Elm No. 3 Common
12,000	"	8/4 Soft Elm No. 2 C. & B.
15,000	"	12/4 Soft Elm No. 2 C. & B.
5,285	"	12/4 Oak No. 2 Common & Better
6,000	"	12/4 Oak No. 2 and 3 Common
12,000	"	4/4 Hard and soft Maple No. 3 C. & B.

PERCY E. HEENEY

Office: 298 Breithaupt St., KITCHENER, ONT.

J. R. EATON & SONS, LIMITED

MANUFACTURERS OF HIGH GRADE WOOD PRODUCTS

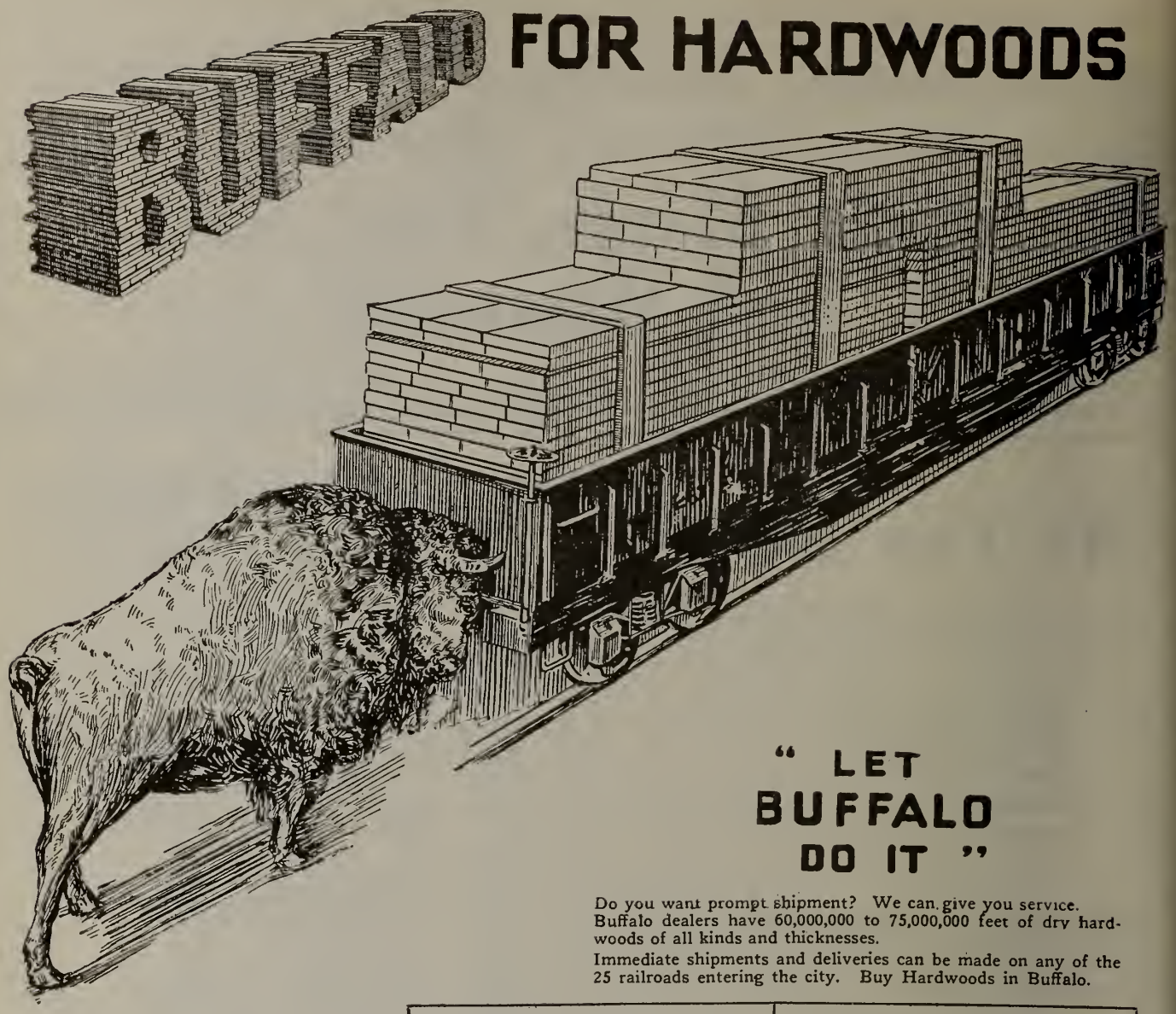
Wood Turnings, Hardwood Dowels, Turned Table Legs, Kitchen Tables, Kitchen Cabinets, Oak Extension Tables, Oak Library Tables, "Empire Brand" Hardwood Flooring in Maple, Birch, and Plain or Quarter Cut Oak, Solid Pine and Veneered Hardwood Doors.

A Large Factory equipped with up-to-date machinery is at your service to furnish "WHAT YOU WANT"— WHEN YOU WANT IT."

YOUR ENQUIRIES SOLICITED

Orillia Ontario Canada

FOR HARDWOODS



"LET BUFFALO DO IT"

Do you want prompt shipment? We can give you service. Buffalo dealers have 60,000,000 to 75,000,000 feet of dry hardwoods of all kinds and thicknesses.

Immediate shipments and deliveries can be made on any of the 25 railroads entering the city. Buy Hardwoods in Buffalo.

FRANK T. SULLIVAN
Specialties:
CHERRY, WALNUT and PACIFIC COAST WOODS
Main Office: 600 Ellicott Square.
Yard: 2598 Delaware Avenue.

T. Sullivan & Company
NORTHERN GREY ELM
and
BROWN ASH
Niagara Street Corner Arthur

Atlantic Lumber Company
HARDWOODS
WEST VIRGINIA SOFT RED AND WHITE OAK
Our Specialty: West Virginia and Pennsylvania Cherry
1055 Seneca Street

Miller. Sturm & Miller
1142 SENECA STREET
Hardwoods of All Kinds

Yeager Lumber Co., Inc.
SPECIALTIES
Oak, Poplar, Ash, Maple
932 Elk Street

STANDARD HARDWOOD LUMBER COMPANY
Hardwoods
Prompt Shipments { From Buffalo Yards or from Mill direct to you
8 MILLION FEET DRY STOCK ON HAND
1333 Clinton St.

G. Elias & Bro., Inc.
Established 1881
All Kinds of Hardwood Lumber
And in addition we carry a full line of White Pine, Yellow Pine, Spruce, Hemlock and Fir Timber, Lumber, Millwork and Boxes—Maple and Oak Flooring
Careful attention to mixed car orders.

Buffalo Hardwood Lumber Co.
J. B. WALL, Pres. T. H. WALL, V.-Pres. M. M. WALL, Treas.
940 SENECA ST.
We Specialize in White Ash, Oak & Maple
We also handle a complete stock of Quartered Oak, Maple, Poplar, Red Cedar, etc.

Hugh McLean Lumber Co.
Hardwoods of All Kinds
Our Specialties—QUARTERED WHITE OAK, SAP AND RED GUM
940 ELK STREET

Taylor & Crate
Hardwoods of All Kinds
A stock of 18,000,000 to 20,000,000 feet of hardwoods carried at all times at our two big Buffalo Yards
Established 50 Years
RAIL OR CARGO SHIPMENTS

Blakeslee, Perrin & Darling
A Complete Stock of Seasoned Hardwoods
including Ash, Basswood, Birch, Cherry, Chestnut, Cypress, Elm, Gum, Hickory, Maple, Plain and Quartered Oak, Poplar and Walnut.
1100 Seneca Street

To —
Furniture,
Desk and Table
Manufacturers

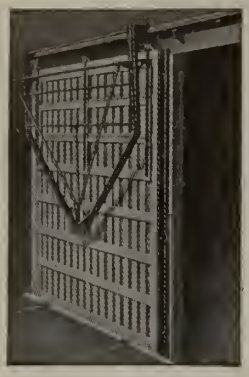
GORHAM PLYWOOD

is well and favorably known in Canada as well as the States and its use in the form of Tops, Drawer Fronts, End Panels etc., in your product, will be a long step in securing the confidence of your customers which will result in orders and re-orders.

Our trademark is stamped on the back of every Top and Panel we make. Our guarantee that it is right and will stay right.

Gorham Brothers Co.
Mount Pleasant, Mich.

The Door Carrier System



Makes your dry-kiln doors steam-tight and saves time, heat, trouble and money.

Carrier lifts door clear of kiln and carries it down track. Returning, deposits door to rabbeted joint, where it is held steam-tight by its own weight. Applicable to old or new kilns.
Ask for catalogue.

DRY KILN
DOOR CARRIER CO.
1117 Cornell Ave.
INDIANAPOLIS, IND.

William S. Whiting Company

JOHNSON CITY, TENNESSEE

1 Band Mill *5 Circular Mills*

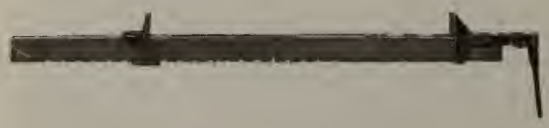
Hardwood Lumber

Oak	Basswood
Maple	Buckeye
Chestnut	Poplar
Ash	Birch

Rotary-Cut Soft Yellow Poplar Veneers
Quarter-Sawn White Oak Flitches
Sliced and Sawn Quartered White OakVeneers
Oak and Maple Flooring
Dowel Pins and Dowel Rods
Glued-Up Chestnut Cores and Dimension

5-16" Oak Parquetry Flooring Strips and Squares carried in stock at our warehouses:
138 44th St., Brooklyn, N.Y., and at Elizabethton, Tenn.

BLACK BROS.
CLAMPS



Where Black Bros. Clamps are known, there is no second choice. Know them.

Carried in stock by leading dealers throughout Canada. Write for Bulletin, and name of nearest dealer.

The Black Bros. Co. - Mendota, Ill., U.S.A.

Peytona Lumber Co. Inc.

HUNTINGTON, W. VA.

BAND MILLS OMAR, CHRISTIAN LOGAN COUNTY, W. VA.

Band Sawed West Virginia Hardwoods

WHITE OAK	BASSWOOD
RED OAK	MAPLE
CHESTNUT	BEECH
POPLAR	HICKORY

Our own facilities for Surfacing, Resawing and Kiln Drying

Arkla Lumber & Mfg. Company

Main Office: - St. Louis, Mo.

Manufacturers and Wholesalers

Ash—Plain and Qtd. White and Red Oak Poplar, Cypress, Gum

In addition to stocks at Mill, we carry a well assorted dry stock of all items on our St. Louis yard available for immediate shipment. Write or wire us (our expense) for quotations.

F. HUNTINGTON SMITH
Canadian Representative

Mercerau-Hawkins Tie Company

Huntington - W. Va.

Manufacturers and Wholesale Dealers

West Virginia and Southern

HARDWOODS

We specialize in

Oak Tie Siding
White and Red Oak
Yellow Poplar
Basswood
Chestnut and
Gum Lumber.

Canadian Sales in Charge of

C. W. PETERS

Vice President and Manager of Lumber Dept.

RUSH LUMBER COMPANY

Manufacturers Southern Hardwoods

Band Mill and Office - Memphis, Tenn.

ASH
2 cars 5/4 No. 2 Com. & Btr.

CYPRESS
1 car 4/4 Shop & Btr.

ELM
3 cars 6/4 Log Run
1 car 8/4 Log Run
1 car 12/4 Log Run

PLAIN RED GUM
1 car 4/4 Com. & Btr.
1 car 5/4 Com. & Btr.
2 cars 4/4 No. 1 Common
2 cars 4/4 No. 2 Common

QTD. RED GUM
2 cars 4/4 No. 1 Common
1 car 6/4 F.A.S.
1 car 6/4 No. 1 Common
1 car 8/4 Com. & Btr.

QTD. RED GUM S.N.D.
2 cars 8/4 No. 1 & Btr.
1 car 10/4 No. 1 & Btr.
1 car 12/4 No. 1 & Btr.

PLAIN SAP GUM
1 car 4/4 F.A.S.
3 cars 4/4 No. 1 Com.
3 cars 4/4 No. 2 Com.
2 cars 4/4 No. 3 Com.
1 car 5/4 Com. & Btr.
2 cars 5/4 No. 2 Com.
1 car 5/4 No. 3 Com.

QTD. BLACK GUM
3 cars 4/4 No. 1 Com. & Btr.
1 car 4/4 No. 2 Com.

PLAIN BLACK GUM
1 car 4/4 Log Run

HICKORY
1 car 6/4 Log Run

QTD. WHITE OAK
2 cars 4/4 No. 1 & Btr.
3 cars 4/4 No. 1 Com.
1 car 4/4 No. 2 Com.
1 car 4/4 2½ to 5½ Cl. Strips
1 car 4/4 1½ to 3 Com. Strips.
2 cars 5/4 No. 1 & Btr.
1 car 6/4 No. 1 Com.

PLAIN WHITE OAK
3 cars 4/4 No. 1 Com.
1 car 4/4 No. 2 Com.
1 car 4/4 No. 1 Com. & Btr. Sound Wormy
1 car 5/4 No. 1 Com. & Btr.
1 car 5/4 No. 1 Com.
1 car 6/4 No. 1 Com.
1 car 5&6/4 No. 3 Com.

PLAIN RED OAK
3 cars 3/4 No. 1 Com. & Btr.
1 car 4/4 No. 1 Com. & Btr.
3 cars 4/4 No. 1 Com.
2 cars 4/4 No. 2 Com.
2 cars 5/4 No. 1 Com. & Btr.
1 car 5/4 No. 1 Com.
1 car 6/4 No. 1 Com. & Btr.

POPLAR
1 car 4/4 F.A.S.
1 car 4/4 Saps & Select
2 cars 4/4 No. 1 Com.
2 cars 4/4 No. 2 Com.
1 car of Dogboards.

Dacus-Richards Hardwood Co.

A. P. DACUS - H. J. RICHARDS

MANUFACTURERS

Southern Hardwood

Specializing in

RED GUM
SAP GUM

PLAIN AND QUARTERED

OAK

Randolph Building,
Memphis, Tennessee.

Mills at EVANSVILLE, Miss., and PRITCHARD, Miss.

Perkins Brothers

Kelso, Ark.

Manufacturers of

Southern Hardwoods

Quartered and Plain White Oak, Plain Red Oak, Gum Elm, Maple, Ash and Cypress

We are also prepared to cut dimension stock to order in Ash, Oak, Gum, Hickory and Elm.

Let us know your requirements.

L. D. LEACH & COMPANY

FISHER BUILDING, - CHICAGO, Ill

Manufacturers Hardwood Lumber

6 Cars 4/4 No. 1 Common Red and White Oak
5 Cars 4/4 No. 2 Common Red and White Oak
4 Cars each 8/4 in. No. 1 and No. 2 Com. R. and W. Oak
2 Cars each 10/4 in. and 12/4 in No. 1 and No. 2 Common Red and White Oak

Oak Furniture — Vehicle and Car Stock Dimensions Sawed to Order

4/4 in. Gum—All Grades
4/4 in. Cypress—All Grades
4/4 in., 8/4 in. and 10/4 in. Log Run Soft Elm

WE offer for prompt shipment the following dry, well manufactured, St. Francis Basin, band sawn hardwoods :—

Quartered White Oak	Quantity	Average Width	Percentage 14 & 16 ft.	Age
4-4 FAS	10,000	7½"	80	5 mos.
5-4 FAS	28,000	7½"-8"	50	5 mos.
6-4 FAS	3,500	7½"-8"	50	6-8 mos.
8-4 FAS	3,000			6-8 mos.
3-4 No. 2 C & B mostly miscuts	3,200			6-12 mos.
4-4 No. 1 Common	400,000		60	5-8 mos.
5-4 No. 1 Common	15,000		60	5 mos.
6-4 No. 1 Common	4,000			6-8 mos.
8-4 No. 1 Common	4,000		50	6-8 mos.
4-4 No. 2 Common	100,000		45	6-8 mos.
Plain White Oak				
4-4 No. 1 Common	500,000		60	5-8 mos.
5-4 No. 1 Common	50,000	9-10"	50	6 mos.
6-4 No. 1 Common	50,000		40	8-10 mos.
8-4 No. 1 Common	50,000		40	6 mos.
5-4 FAS	30,000		50	6 mos.
6-4 FAS	12,000	9-10"		10 mos.
4-4 No. 2 Common	350,000		55	6-8 mos.
Quartered Red Oak				
4-4 No. 1 & 2 Com.	30,000		55	5-8 mos.
Plain Red Oak				
5-4 FAS	30,000	9-10"	40	6-8 mos.
6-4 FAS	14,000	9-10"	25	6 mos.
8-4 FAS	20,000	9-10"	50	6 mos.
4-4 No. 1 Common	600,000		60	5-8 mos.
5-4 No. 1 Common	30,000		45	6-8 mos.
6-4 No. 1 Common	15,000		25	6 mos.
8-4 No. 1 Common	40,000		50	6 mos.
4-4 No. 2 Common	600,000		60	6-8 mos.
Plain Red & White Oak				
4-4 Sound Wormy	75,000			6-8 mos.
4-4 No. 3 Common	500,000			6-8 mos.
Quartered Red Gum				
5-4 No. 1 Common	12,500		60	8-10 mos.
6-4 C & B 75 p.c. FAS	15,000	5" & Up	65	7 mos.
8-4 No. 1 Common	3,000			1 yr.
8-4 No. 1 Common SND	10,000	5-6"	80	1 yr.
Plain Red Gum				
5-8 No. 1 C & B	1,100		50	1 yr.
3-4 No. 1 C & B	1,800		50	6-8 mos.
5-4 No. 1 C & B	8,500		60	4 mos.
6-4 FAS	14,000		75	12-14 mos.
6-4 No. 1 Common	43,000		75	12-14 mos.
Plain Sap Gum				
4-4 FAS	50,000	13-17"	60	6-8 mos.
4-4 Box Boards	75,000	9-12"	60	6-8 mos.
4-4 Pan & Wd. No. 1	3,500	18" & Up		6-8 mos.
5-4 No. 1 Common	100,000	9"	60	6-8 mos.
5-4 FAS	50,000	10-10½"	60	6-8 mos.
6-4 FAS	15,000	9-9½"	60	1-3 mos.
6-4 No. 1 Common	35,000		60	1-3 mos.
4/4 No. 1 Common	200,000		65	1-6 mos.
Ash				
4-4 FAS	18,000	7½"-8"	30	1-3 mos.
4-4 No. 1 Common	42,000	7½"-8"	30	1-3 mos.
6-4 FAS	3,500		30	6 mos.
6-4 No. 1 Common	3,500		30	6 mos.
8-4 FAS	15,000		35	1-3 mos.
8-4 No. 1 Common	15,000		35	1-3 mos.
10-4 FAS	32,000		40	6-8 mos.
10-4 No. 1 Common	32,500		40	6-8 mos.
12-4 FAS	7,500		30	1-2 mos.
12-4 No. 1 Common	7,500		30	1-2 mos.
16-4 No. 1 C & B	2,800		30	4-6 mos.
Cottonwood				
4-4 FAS	100-000	6-12"	70	8-10 mos.
4-4 FAS	30,000	13-17"	50	8-10 mos.
4-4 Pan & Wd. No. 1	5,000		30	8 mos.
4-4 Box Boards	30,000	9-12"	60	8 mos.
4-4 Box Boards	20,000	13-17"	60	8 mos.
4-4 No. 1 Common	100,000		60	6-8 mos.
4-4 No. 1 Common	50,000		60	1-3 mos.
4-4 No. 2 Common	100,000		70	3-6 mos.
Elm				
8-4 FAS	18,000		60	2 mos.
8-4 No. 1 Common	27,000		60	2 mos.
10-4 FAS	14,400		70	6 mos.
10-4 No. 1 Common	21,600		70	6 mos.
12-4 FAS	8,000		40	1-2 mos.
12-4 No. 1 Common	12,000		40	1-2 mos.
Maple				
4-4 No. 2 C & B	100,000		50	4-6 mos.
5-4 No. 2 C & B	60,000		60	6-8 mos.
6-4 No. 2 C & B	27,000		60	6-8 mos.
8-4 No. 2 C & B	40,000			6-8 mos.
8-4 No. 2 C & B	80,000		50	2-3 mos.

MILLER LUMBER COMPANY MARIANNA, ARKANSAS, U.S.A.

WHEELER - TIMLIN LUMBER CO.

WAUSAU, Wisconsin.

You cannot beat the Birch for an all round wood for the furniture manufacturer. We have BEAUTIFUL BIRCH in all standard thicknesses from 4/4″ to 10/4″ and all grades. Write us for delivered prices.

Mills at DORCHESTER, Wis., and WITTENBERG, Wis.

The Hyde Lumber Co.

Band Mills: LAKE PROVIDENCE LA.
Southern Office: MEMPHIS, TENN.
Bank of Commerce Bldg.
Northern Office: SOUTH BEND, IND.

MANUFACTURERS

Plain Red Gum
Quartered Red Gum
Plain Sap Gum
Quartered Sap Gum
Cottonwood, Cypress
Tupelo, Ash, Elm, Oak

CHARLES O. MAUS
Canadian Representative

Chas. F. Luehrmann Hardwood Lumber Co.

Manufacturers and Wholesalers of

Hardwood and Yellow Pine Lumber

Office and Yard: 148 Carroll St. St. Louis, Mo

Hardwood and Yellow Pine for Immediate Shipment from Stock

Complete Stock of Built Up Panels
3 and 5 Ply—Carried in Stock at St. Louis

FIR DRAWER BOTTOMS
FIR DOOR PANELS

Write us for our Stock and Price List

Aromatic Tennessee Red Cedar

CAR LOAD LOTS
OR LESS

Earthman Lumber Co.
Murfreesboro, Tenn.

Quality plus Service

AT RIGHT PRICES

Let us quote you on concave chair seat, turned office, piano, restaurant and bath-room stool tops.

Solid table tops, cabinet work; in fact woodwork of all description.

Algoma Wood Products Co.
ALGOMA, WIS.

Sawed Veneer

Quartered White Oak
For Furniture and Panels

Plain Red Oak
For Interior Trim and Doors

Cypress
For Battery Separators

Manufacturing Uniformly Good.
Quality Unsurpassed

James E. Stark & Co., Inc.
MEMPHIS, TENN.

BEDNA YOUNG Lumber Company

Jackson - Tennessee

Manufacturers of

Quartered White Oak
Quartered Red Oa
and Other Hardwoods

When in the market for

High Grade Lumber

please let us have your enquiries.

Sales Office: 610 Lombard Bldg.
Indianapolis, Indiana

Since Colonial Days

Oak Floors have been the standard in representative American homes.

Oak Flooring is recognized — almost by second nature — as the *best* flooring material for homes of every type and size.

In public and semi-public buildings, apartments, hotels and offices it is the logical *first choice.*

Bruce OAK FLOORING THE BEST *Oak Flooring*

has definitely established its super-excellence in homes and buildings from Coast to Coast.

In addition to its intrinsic worth, Bruce Oak Flooring affords the trade a merchandising service seldom equaled in precision and convenience. *Dealers can always get it.*

Square edge parquetry strips, Oak trim, mouldings and hardwood lumber in the same car with Oak Flooring if desired. Prices and particulars on request.

E. L. BRUCE COMPANY

MANUFACTURERS
MEMPHIS, TENN.
Flooring Plant: LITTLE ROCK
Band Mill: LITTLE ROCK

MEMPHIS BRUCE LITTLE ROCK

WE ARE TELLING THE PUBLIC: "BE SURE YOUR WALNUT IS WALNUT."

AMERICAN WALNUT

"The Cabinet-wood Superlative."

WE ARE TELLING THE PUBLIC: "BE SURE YOUR WALNUT IS WALNUT."

WALNUT—"*THROUGH and THROUGH*"

PUBLIC INTEREST in genuine American Walnut furniture—"*Walnut Through and Through*"—is rapidly increasing, due to the beauty and exceptional qualities of this historically superior cabinet-wood.

This Association is constantly receiving evidence of this from many sources.

Information of this sort provides a Valuable Guide to profitable business for the makers and distributors of fine furniture—doesn't it?

Our National advertising—extended and strengthened
—is carrying to the consumer this message:

"BE SURE YOUR WALNUT IS WALNUT."

THE AMERICAN WALNUT MANUFACTURERS' ASSOCIATION
ROOM 1019 616 SOUTH MICHIGAN BOULEVARD CHICAGO

We specialize in Birch, Basswood, Hard Maple

	500M	4-4	Unselected	Birch	500 M	4-4	Basswood	500M	4-4	Hard Maple	
	300M	5-4	"	"	300M	5-4	"	400	5-4	"	
A	150	6-4	"	"	200	6-4	"	400	6-4	"	
High	125	8-4	"	"	75	8-4	"	600	8-4	"	
Standard	150	10-4	"	"				400	10-4	"	
of	150	12-4	"	"				300	12-4	"	
Quality	75	14-4	"	"				75	14-4	"	
and	75	i6-4	"	"				100	16-4	"	

Service

Sawyer Goodman Company

Marinette - Wisconsin

Reese Sheriff Lumber Co.

WILLIAMSPORT, PENNSYLVANIA

Manufacturers of

Northern and Southern Hardwoods White Pine, Spruce and Hemlock

With special attention to **Oak, Chestnut, Poplar, Cherry, Walnut, Gum and Basswood.**

OUR MOTTO

REASONABLE PRICES—that you can afford to pay.
EFFICIENT SERVICE — that you have a right to expect
FAIR TREATMENT — that you can depend on getting

We would appreciate an opportunity of furnishing a portion of your lumber requirements.

TO MEET COMPETITION

It will be necessary to put better lumber into your product. Indiana Oak is known to be the best. It costs no more than the other kinds—then why not get it?

We are the largest manufacturers of hardwoods in Indiana and give you below a partial list of the stock that we have ready for shipment:

INIDIANA QUARTERED WHITE OAK

	1s&2s	No. 1 C.	No. 2 C.
1/2"	1 car	1 car	
5/8"	2 "	4 "	
3/4"	1 "	5 "	1 car
4/4"	3 "	4 "	4 "
5/4"	1 "	3 "	1 "
6/4"	1 "	3 "	
8/4"	1 "	2 "	

Also Clear and No. 1 Common Quartered White Oak Strips .

INDIANA QUARTERED RED OAK

	1s&2s 6"&up	1s&2s 9"&up	No. 1 C.	No. 2 C.
1/2"	3500'			
5/8"	1 car		1 car	
4/4"	3 "	1 car	3 "	1 car
5/4"	2 "	1 "	2 "	
6/4"	2 "	2500'	1 "	
7/4"	1 "	4500'		
8/4"	2000'	3000'	1 "	

PLAIN WHITE OAK

	1s&2s	No. 1 C.	No. 2 C.
5/8"	1 car	1 car	
3/4"		4000'	
4/4"	2 cars	4 cars	2 cars
5/4"	1 "	3 "	1 "
6/4"	1 "	2 "	
8/4"	3 "	2 "	
2½"	½ "	1 "	

PLAIN RED OAK

	1s&2s	No. 1 C.	No. 2 C.
5/8"	2 cars	2 cars	
3/4"		5000'	
4/4"	4 cars	4 cars	3 cars
5/4"	1 "	3 "	
6/4"	1 "	4 "	
8/4"	2 "	3 "	
2½"	2 "	3 "	

BLACK WALNUT—Steamed Stock

	1s&2s	No. 1 C.	No. 2 C.
4/4"	1 car	3 cars	12000'
5/4"	1 "	1 "	9000'
6/4"	4000'	4000'	
8/4"	1 car		

1 car 5/8" Log Run, not steamed.

WE ARE IN POSITION TO KILN DRY THIS LUMBER. ASK FOR OUR RATES.

We also have good stocks of Poplar, Ash, Beech, Hickory, Maple, Gum, Tupelo, etc.—Write us for prices.

Maley & Wertz Lumber Company

EVANSVILLE, INDIANA

We guarantee that our Walnut Lumber after having been steamed in our Steam Kilns for four days, then placed on sticks for six days, during fair weather, can be placed in your Dry Kilns immediately and dried with greater safety than unsteamed lumber, green from the saw and placed on sticks for ninety days. This method of steaming lumber enables us to furnish material without delay.

QUALITY

SERVICE

Full loaded capacity of nine kilns, 100,000 feet.

American Walnut Lumber

All grades and thicknesses

Pickrel Walnut Company

St. Louis, Missouri

Stimson Veneer and Lumber Co.

(Inc.)

Office and Mill: McLean Ave. and Union Belt R.R.

Memphis - Tenn.

We sell only the product of our own mills and make band sawn lumber in all Southern Hardwoods.

We specialize in Quartered White Oak, Red Oak, and Red Gum.

With allied companies we make fifty million feet annually.

J. V. Stimson Hardwood Co.

Manufacturers and Exporters

Band Mills: Memphis, Tenn., Helena, Ark.

Memphis - Tenn.

STOCK LIST

QUARTERED WHITE OAK
- 3 cars 4/4" 1s and 2s.
- 5 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common .

QUARTERED RED OAK
- 5 cars 4/4" 1s and 2s.
- 10 cars 4/4" No. 1 Common.
- 4 cars 4/4" No. 2 Common.
- 2 cars 6/4" No. 1 Common and Better.

QUARTERED RED GUM
- 10 cars 4/4" 1s and 2s.
- 3 cars 4/4" 1s and 2s Fig.
- 2 cars 5/4" 1s and 2s.
- 2 cars 6/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 2 cars 5/4" No. 1 Common.
- 2 cars 6/4" No. 1 Common.

QUARTERED RED GUM, Sap no Defect
- 5 cars 6/4" No. 1 Common and Better.
- 10 cars 8/4" No. 1 Common and Better.

ASH
- 4 cars 10/4" No. 1 Common and Better.
- 1 car 12/4" No. 1 Common and Better.
- 1 car 6/4" No. 1 Common and Better.
- 2 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common.

SAP GUM
- 10 cars 4/4" 1s and 2s.
- 20 cars 4/4" No. 1 Common.
- 10 cars 4/4" No. 2 Common.
- 2 cars 4/4" 18" up Panel.
- 5 cars 4/4" 13-17" Box Boards.

PLAIN RED OAK
- 2 cars 4/4" 1s and 2s.
- 2 cars 6/4" No. 1 Common and Better.
- 2 cars 10/4" No. 1 Common and Better.

PLAIN WHITE OAK
- 4 cars 4/4" No. 1 Common Plain.

COTTONWOOD
- 2 cars 4/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 5 cars 4/4" No. 2 Common.

ELM
- 2 cars 4/4" Log Run.
- 10 cars 10/4" Log Run.
- 10 cars 12/4" Log Run.

MAPLE
- 4 cars 12/4" Log Run.

THE above photograph was taken at one of our logging camps and illustrates the up-to-date equipment used in all our operations from the stump to the lumber on our yards.

The five Oak logs shown on the trailers are each 12 feet long and were all cut from one tree, the butt cut measured fifty-one inches in diameter. These five logs measured 6,489 feet.

We operate two modern band mills on our own timber, and manufacture all the lumber we ship, which enables us to furnish stock of even grade, color and texture.

We will appreciate an opportunity of serving you and will be pleased to quote you at all times.

Manufacturers of all kinds of high grade Southern Hardwoods.

DIRECT FROM PRODUCER TO CONSUMER

GAYOSO LUMBER COMPANY

MEMPHIS, TENNESSEE, U.S.A.

Canadian Representative: W. R. Youmans, 972 College Street, Toronto, Ontario
Telephone Parkdale 6751 W.

Nichols & Cox Lumber Co.

GRAND RAPIDS - MICHIGAN

We can ship promptly the following items. Can also kiln dry if desired.

2 cars	4/4	1st and 2nd	Sap Gum
5 "	4/4	No. 1 Com.	"
3 "	5/4	No. 1 Com. and Better	"
2 "	6/4	"	"
2 "	8/4	"	"
4 "	6/4	"	Qtd Sap Gum
5 "	8/4	"	"
3 "	10/4	"	"
2 "	12/4	"	"
2 "	4/4	"	Plain Red Gum
1 "	5/4	"	"
1 "	6/4	"	"
1 "	8/4	"	"
2 "	4/4	1st and 2nd	Plain Red Oak
3 "	4/4	No. 1 Com.	"
1 "	5/4	No. 1 C & B	"
1 "	6/4	"	"
1 "	8/4	"	"
1 "	4/4	1st and 2nd	Plain White Oak
2 "	4/4	No. 1 Com.	"
2 "	10/4	No. 1 Com. and Better	Birch
1 "	12/4	"	"
1 "	10/4	"	Basswood
5 "	6/4	No. 2 Com. and Better	Gray Elm
5 "	4/4 to 8/4	No. 1 Com. and Better End Dried	White Maple

Send us your enquiries for anything needed in Northern and Southern Hardwoods.

DIMENSION

My Specialty is

Dimension Lumber

For Manufacturers of

Wagons and Implements, Buggies and Autos, Furniture, Railroad Car and Track Material

Standard Sizes on Hand for Prompt Shipment. Special Sizes Cut to Order

SOUTHERN HARDWOOD LUMBER

C. B. COLBORN

438 Randolph Building

MEMPHIS - TENN.

West Virginia Oak

Thoroughly Dry, Accurately Sawn, Soft Textured, and Uniform in Color.

Write us when needing choice stocks. All lumber produced from virgin timber of large size and excellent quality.

Twenty Million Feet Hardwood Ready for Immediate Shipment

OAK

Yellow Poplar, Ash, Hickory, Beech, Chestnut, Basswood, Walnut, Maple

THE THOMAS HALL LUMBER COMPANY

Manufacturers

CHARLESTON, - WEST VIRGINIA

M. BROWN, Canadian Repres. **Address: 87 Neville Park Blvd., Balmy Beach, Toronto**

CHAPMAN and DEWEY LUMBER CO.

Manufacturers

Band Sawn — Carefully Graded

FURNITURE STOCK

10 Cars 5/4" FAS and No. 1 Com. Sap Gum
5 Cars 4/4" No. 1 Com. and Selects Sap Gum
3 Cars 4/4" No. 1 Com. and Selects Red Gum
5 Cars 4/4" No. 1 Com. and Selects Pl. Red Oak
2 Cars 4/4" No. 1 Com. and Selects Pl. White Oak

Also fully assorted stock in Ash, Soft Maple, Elm, Cypress, Cottonwood. We can save you freight by shipping stock, surfaced and resawn. We will gladly quote you delivered prices, payable Canadian funds.

Chapman and Dewey Lumber Co.
KANSAS CITY, Mo. MARKED TREE, Ark.

DRY STOCK

For Immediate Shipment

SOFT ELM		
6905′	1″	—No. 1 C&B
3195′	1″	—No. 2 Com.
41030′	1½″	—No. 1 C&B
2356′	1½″	—No. 2 Com.
56880′	2″	—No. 1 C&B
10046′	2″	—No. 2 Com.
110594′	2½″	—No. 1 C&B
26985′	2½″	—No. 2 Com.
11750′	3″	—No. 2 Com.
WHITE ASH		
87846′	2″	—No. 1 C&B
3072′	2″	—No. 2 Com.
139960′	2½″	—No. 1 C&B
13537′	2½″	—No. 2 Com.
18992′	3″	—No. 1 C&B
608′	3″	—No. 2 Com.
HICKORY		
650′	1″	—No. 1 C&B
1408′	2″	—No. 1 C&B
COTTONWOOD		
1620′	1″	—No. 1 C&B
19956′	2″	—No. 1 C&B
1196′	2″	—No. 2 Com.
BLACK WALNUT		
2873′	1″	—No. 1 C&B
1151′	1″	—No. 2 Com.
WILLOW		
1446′	1″	—No. 1 C&B
CHERRY		
4747′	1″	—No. 1 C&B
2137′	1″	—No. 2 Com.
ROCK ELM		
12493′	2″	—No. 1 C&B
SOFT MAPLE		
14397′	2¼″	—No. 1 C&B
BASSWOOD		
1549′	1″	—No. 1 C&B
606′	2″	—No. 1 C&B
BUTTERNUT		
2584′	1″	—No. 1 C&B
HARD MAPLE		
31788′	1″	—No. 1 C&B
243927′	1¼″	—No. 1 C&B
227707′	1½″	—No. 1 C&B
1796′	1½″	—No. 2 Com.
217401′	2″	—No. 1 C&B
11410′	2″	—No. 2 Com.
38016′	2½″	—No. 1 C&B
11091′	3″	—No. 1 C&B
2796′	4″	—No. 1 C&B
BEECH		
3000′	1½″	—No. 2 Com.
500′	2″	—Log run
250′	2½″	--Log run
350′	3″	—Log Run
100′	4″	—Log run
BIRCH		
15998′	1″	—No. 1 C&B
22311′	1¼″	—No. 1 C&B
11748′	1½″	—No. 1 C&B
50157′	2″	—No. 1 C&B
87172′	2½″	—No. 1 C&B
7866′	3″	—No. 1 C&B
PLAIN OAK		
9369′	1″	—No. 1 C&B
1107′	2″	—No. 1 C&B

The above stock is in our Battlecreek yard and we are so located that we can load and ship stock immediately upon receipt of your orders. We guarantee National Hardwood Lumber Association grades.

PAYSON SMITH LUMBER CO.
Plymouth Building - MINNEAPOLIS, Minn.

OAK

Plain and Quartered
Uniform Color—Soft Texture

Poplar, Ash

and other

Hardwoods

We carry 35,000,000 feet dry stock—all of our own manufacture.

Oak Timbers and Planking

The Mowbray & Robinson Co.
(INCORPORATED)
Manufacturers
Office: CINCINNATI, OHIO

MILLS
Quicksand, Ky.; West Irvine, Ky.

Canadian Representative :
A. K. Johuson, Traders Bank Building, Toronto, Ont

E. SONDHEIMER CO.

MEMPHIS, TENN., U.S.A.

Band Mills at
Baton Rouge, La., Sondheimer, La., Tallulah, La.
Office & Distributing Yard, Memphis, Tenn.

Manufacturers of Southern Hardwoods **Dry Stock Ready for Shipment**

Ask us for prices. We may be able to save you some money. We specialize in genuine Tensas Basin Red Gum—best in the world.

WHITE ASH
1 car each 1", 1¼", 1½" 1s&2s
2 " 2" 1s & 2s
7 " 1" No. 1 Com. & Sel.
3 " 1¼" No. 1 Com. & Sel.
1 " 1½" No. 1 Com. & Sel.
3 " 2" No. 1 Com. & Sel.
1 " each 2½" & 3" ditto
5 " 1" No. 2 Common
2 " 2" No. 2 Common
1 " 2½, 3½, 4" No. 2 Cm.

COTTONWOOD
5 " 1" 1s&2s
1 " 1½" 1s&2s
10 " 1" No. 1 Common
5 " 1¼" No. 1 Common
5 " 1½" No. 1 Common
3 " 1" No. 2 Common
4 " 1¼" No. 2 Common
10 " 1½" No. 2 Common
2 " 1x 9 to 12" Box Bds.
2 " 1x13 to 17" Box Bds.

CYPRESS
1 " 1" Shop
2 " 1" No. 1 Common
1 " each 1x 4, 1x 8", No. 1 Com.
1 " each 1x10, 1x12", No. 1 Com.
1 " 1" Pecky

SOFT ELM
2 " 1½" Log Run
5 " 2" Log Run

PLAIN SAP GUM
10 " each 1" & 1¼" 1s&2s
15 " 4/4" No. 1 Common
2 " 5/4" No. 1 Common
15 " 4/4" No. 2 Common
10 " 5/4" No. 2 Common
5 " 4/4" No. 3 Common

BLACK GUM
1 " 1" Log Run

PECAN
3 " 6/4" Log Run
4 " 8/4" Log Run

MAGNOLIA
2 " 1" No. 2 Common
1 " 1" No. 2 Common

QRTD. RED GUM
5 " 1" 1s&2s
3 " 1¼" 1s&2s
2 " 2" 1s&2s
1 " each 2½ & 3" 1s&2s
8 " 1" No. 1 Common
3 " each 1¼ & 2" No. 1 C.

QRTD. RED GUM
(Sap No Defect)
10 " 1" 1s&2s
1 " 1¼" 1s&2s
3 " 2" 1s&2s
5 " 1" No. 1 Common
3 " each 1¼ & 2 "No. 1 C.

QRTD. WHITE OAK
3 " 1" No. 1 Common
1 " 1" No. 2 Common

QRTD. RED OAK
3 " 1" 1s&2s
5 " 1" No. 1 Common
2 " 1" No. 2 Common

PLAIN WHITE OAK
1 " 3/4" 1s&2s
1 " 3/4" No. 1 Common
6 " 4/4" No. 1 Common
5 " 4/4" No. 2 Common

PLAIN RED OAK
2 " each 1" & 1¼" 1s&2s
15 " 1" No. 1 Com. & Sel.
1 " 1¼" No. 1 Com. & Sel.
10 " 1" No. 2 Common
1 " 1¼" No. 2 Common
5 " 1" Sound Wormy
8 " 1" No. 3 Common

QRTD. TUPELO
1" 1s&2s

PLAIN-SAWN TUPELO
6 " 1" 1s&2s
10 " 1" No. 1 Common
5 " 1" No. 2 Common
1 " 1" No. 3 Common
1 " 1x13 to 17" Box Bds.

WILLOW
8 " 1" 1s&2s
5 " 1¼"1s&2s
1 " each 1½ & 2" 1s&2s
15 " 1" No. 1 Common
8 " 1¼" No. 1 Common
1 " 1½" No. 1 Common
10 " 1" No. 2 Common
8 " 1¼" No. 2 Common
10 " 1½" No. 2 Common
5 " 2" No. 2 Common
1 " 1x13 to 17" Box Bds.

Lumber
Walnut, Mahogany Plain and Quartered Oak, Ash, Cherry

Veneers
Walnut and Mahogany

WE specialize in AMERICAN BLACK WALNUT and can furnish straight cars from 3/8 to 4 inches in thickness. Also can load mixed cars WALNUT and MAHOGANY LUMBER and VENEERS, PLAIN and QUARTERED RED and WHITE OAK, ASH and HERRY.

The Kosse, Shoe and Schleyer Co.

Eastern Branch:
BALTIMORE, Md.

Main Office and Band Mill:
CINCINNATI, Ohio

30 Million Feet Hardwoods Yearly

Manufactured by

Darnell-Love Lumber Co.

Leland, Mississippi

We own and operate two large band mills with sufficient timber to supply these mills, at present capacity, fifteen to twenty years.

Cutting

Oak, Ash, Gum, Elm

Cypress, Cottonwood

and various other Native Woods

Our Specialties are—

3/8", 1/2", 5/8" and 3/4" in Gum and Oak

and

8/4" Quartered Red Gum

8/4" Quartered Red Gum Sap No Defect

WE SOLICIT YOUR INQUIRIES AND ORDERS

Thompson-Katz Lumber Co.

Manufacturers of

WHITE ASH EXCLUSIVELY

In dealing with us the wood worker and furniture manufacturer may rightly expect a better service, better value and a greater selection from which to choose his requirements. We have all grades and all thicknesses to offer—beautiful stock that we know will please you. Drop us a card to-day—we'll do the rest.

MEMPHIS, TENNESSEE

J. H. Bonner & Sons

Memphis, Tenn.

Mills:

Jonquil and Ruffwood, Ark.

Manufacturers

Band Sawn Hardwood Lumber

Write or wire for prices on

Gum, Oak, Elm, Etc.

Frank Purcell Walnut Lumber Co.

Plenty of logs like the portion of our stock shown above have made possible the million and a half foot stock of well manufactured American Walnut Lumber which we now have to offer.

Prompt shipment

All grades and thicknesses

Guaranteed Inspection

12th AND BELT LINE

Kansas City - Kansas

— A name worth remembering —

Thomas E. Powe Lumber Co.

St. Louis, Mo.

Manufacturers and Wholesalers of

SOUTHERN HARDWOODS

Specializing in

Ash-Oak-Gum-Poplar

Mills: PRESCOTT, ARK.—DOTHAN, ALA.

ST. LOUIS YARD

Mixed Carload Shipments — Carry stocks of the following:

Hickory	Magnolia	Elm
Maple	Willow	Sycamore
Tupelo	Red Cedar	Beech
Cypress	Plain Oak	Quartered Oak
Sap Gum	Red Gum	Mahogany
Poplar	Ash	Black Gum
Yellow Pine		

WAYNE LUMBER CO.

Manufacturers and Wholesalers

Canadian Hardwoods

- - BIRCH AND MAPLE - -

OUR SPECIALTY

Elm, Ash, Basswood, Beech, Chestnut, Oak, and Poplar

110 West 40th St. New York

Canadian Representative,
D. Cote, 730A Champagneur, Outremont, Montreal

A name that should be on your inquiry list for Hardwood Lumber

American Column & Lumber Co.

Brunson Building, COLUMBUS, OHIO

—Manufacturers of—

West Virginia

Soft Yellow Poplar
Plain White Oak
Plain Red Oak
Quartered White Oak
White Oak Timbers and Plank

Chestnut	Butternut
Basswood	Ash
Maple	Cherry
Hickory	Walnut
Beech	Sycamore
Buckeye	Black Gum
Birch	Hemlock

Oak and Hardwood Dimension Stock

Steele & Hibbard Lumber Co.

ST. LOUIS, MO.

56 Years in Business

We carry a large stock of dry

Hardwood Lumber

25 Different Kinds
Quick Shipment
Write or wire for Prices

We specialize Oak cut from Mild Texture Missouri Timber with thin sap both plain and quarter sawed.

We ship also from Sawmills direct; Red as well as Sap Gum and Poplar both plain and quarter sawed, Sound Wormy Chestnut, Cypress and Ash.

"Wire collect for prices or other information. Time is Money, delays pay no dividend."

Chas. Gill Lumber Co.

WAUSAU, WISCONSIN

MANUFACTURERS & WHOLESALERS

SPECIALIZING IN

MAPLE BIRCH AND BASSWOOD

Complete Stock Crating Material

We solicit correspondence relative to all Northern Hardwoods

Chicago Office — 501 Lumber Exchange

Band Sawn West Virginia Hardwoods

Our timber, of virgin growth in Greenbrier and Pocahontas Counties, limestone soil, gives a combination of Texture, Quality and Character that is most desirable to the Woodworking trade.

The most critical Hardwood users are among our best accounts. Why?

The W. C. Barlett Lumber Co.

Charleston, W. Va.

A "Quality" you will admire
A "Service" you will appreciate

We have the facilities for giving Canadian Woodworkers and Furniture Manufacturers a prompt service on straight or mixed cars of the following:

Ash, Oak, Gum, Poplar, Hickory, Walnut, Chestnut, Beech, Maple, Elm, Sycamore, Cottonwood.

Soft textured Plain and finely figured Quarter-Sawn Red and White Oak our specialty.

J. V. Stimson & Company

OWENSBORO - KENTUCKY

Bandmills. Owensboro; Campbellsville, Kentucky

D. E. Hewit Lumber Co.

Huntington, W. Va.

MANUFACTURERS

West Virginia Hardwoods

(Not Better than the Best but as Good as the Best)

FAS Plain White and Red Oak
No. 1 Com. Plain White and Red Oak
Implement Oak
Sound Wormy Chestnut
No. 1 Common and Better Chestnut
Hickory Plank
Poplar and Basswood

St. Francis Basin Hardwoods

Kraetzer Cured and Air Dried

Tennessee Aromatic Red Cedar

Carloads and less or mixed with Hardwoods

"What Others Say"

"Your letter of February 15th received and we want to say that this was a very nice lot of lumber. It was good widths and lengths and well manufactured, dry stock and the grading was very liberal. We are sorry we cannot use more of this lumber at the present time. *We received several cars from other manufacturers at a cheaper price but the lumber was not nearly as satisfactory.* When we are in need of more stock we will take the matter up with you."

(Note—The above was sent us February 24, 1921 unsolicited. Name given on application).

GEO. C. BROWN & COMPANY

Home Office - MEMPHIS, TENN.

BAND MILLS, PROCTOR, ARK. CROOKED BAYOU, ARK.

The Arrow Lumber Co.

Manufacturers and Wholesalers of
West Virginia Hardwoods and White Pine

Oak Timbers Our Specialty

PARKERSBURG, W. VA.
Mills: Raleigh, W. Va. Natural Well, Va.

McLEAN MAHOGANY & CEDAR CO., INC.

American Hardwoods

WE SOLICIT YOUR ENQUIRIES

742 Ellicott Square, Buffalo, N.Y.

Yellow Poplar Lumber Co.

Manufacturers of Band Sawed

Poplar Plain Oak
Quartered Oak
Chestnut Basswood

Capacity 50,000,000 per annum

SPECIALTY: Monogram Brand Oak Flooring

CANADIAN ENQUIRIES SOLICITED

COAL GROVE, OHIO, U. S. A.

Tennessee Lumber & Coal Company

Manufacturers and Wholesalers

APPALACHIAN HARDWOODS

Soft Textured White and Red Oak, Poplar, Chestnut, Southern Gum

OAK TIMBERS AND PLANKING CUT TO ORDER

Band Mills: Verdun, Tenn., Louvain, Tenn. Submit your enquiries to our Sales office, Cincinnati, Ohio.

"Hartzell's Choice Walnut"

The way Walnut comes to us

COMING AND GOING

One constant stream of American Black Walnut from "Stump to Consumer" flowing through a steady, reliable and satisfactory channel.

"Geo. W. Hartzell"

Logs in the rough coming in Veneers and Lumber of the highest quality going out daily year in and year out covering a period of 35 years.

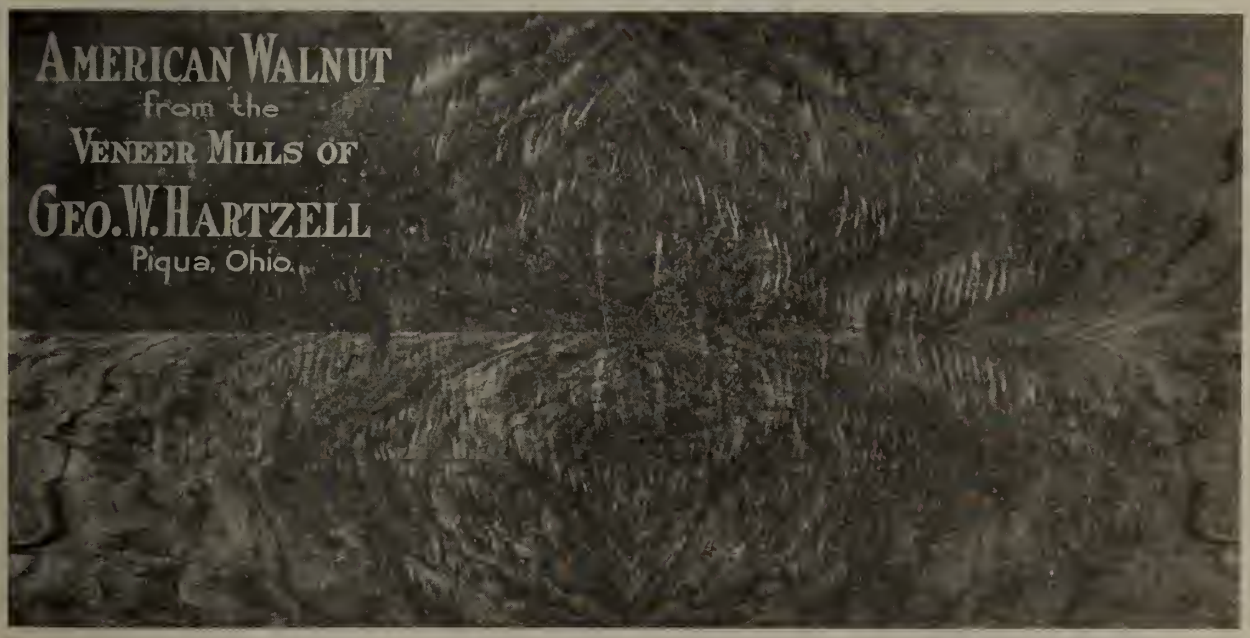
We rightfully claim your patronage because of "SERVICE and QUALITY," if there is any question in your mind about it

"Try Us and We Will Ship You the Convincer"

No Order too large, no Order too small to receive the close and careful attention it is our custom to give. That is a great part of our business, serving our customers.

"WRITE FOR SAMPLES AND QUOTATIONS"

Geo. W. Hartzell - Piqua, Ohio



The way it goes to our Customers

High Grade White Hickory

Why Pay High Freights on Waste Material? Stock sawed free and clear of defects to specified sizes. Waste eliminated at source. Operating numerous Mills throughout the choicest HARDWOOD BELTS in the United States.

"Buttcutt" Brand

Hickory, Oak and Ash

DIMENSION STOCK

Ski Billets, Picking Sticks, Hockey Sticks, Coupling Rods, Handle Blanks, Furniture Stock, Dowel Blanks, Rim Strips, Spoke Blanks, Shaft and Pole Stock, Gear Woods, Vehicles and Motor Woods for Bending Purposes.

Brown Brothers Company
MANUFACTURERS
11 Broadway - New York

The BRAND of QUALITY

Bigelow HARDWOOD PRODUCTS

The SYMBOL of SERVICE

A Complete Stock of Assorted Grades and Thicknesses

NORTHERN HARDWOODS

ASH, BEECH, BIRCH, BASSWOOD
SOFT ELM, ROCK ELM, HARD MAPLE

THE BIGELOW-COOPER CO.
BAY CITY - - MICHIGAN

American Hardwood Lumber Co.

St. Louis, Mo.

Large stock of—

Dry Ash, Quartered Oak Plain Oak and Gum

Shipments from — NASHVILLE, Tenn., NEW ORLEANS, La., and BENTON, Ark.

Dowels, Turnings, Knobs, Spindles, Buttons, Drawer Stops, Table Pins, Screwhole Plugs. Special Woodwork to order.

No 2 Dowel Pin

HENRY ROWE MFG. COMPANY NEWAYGO, Mich.

Indiana

Quartered Red and White

OAK

1,000,000 feet of dry stock carried at all times

ALSO PLAIN OAK AND ASH

We manufacture all stock carried

Evansville Band Mill Co.

FRANK M. CUTSINGER, Pres.
GEO. H. FOOTE, Vice-Pres. & Treas.
JOSEPH WALTMAN, Secretary

Mills at EVANSVILLE, Indiana

Upham & Walsh Inc.

Throop St. South of 22nd St.

Chicago

Northern and Southern Hardwoods

We make a Specialty of

Oak, Gum, Elm, Maple Birch and Basswood.

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130,000 ft. 4-4" No. 1 and No. 2 Com. Qtrd. White Oak
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Manufacturers of White and Red Oak, Poplar, Gum, Ash, Magnolia and Beech

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THIRTEEN BAND MILLS
SIX PLANING MILLS
ELEVEN FLOORING UNITS
NINE DIMENSION MILLS

ANNUAL CAPACITY:
130,000,000 feet.

No more important service can be rendcredbusiness in general than to help sccure a fair reduction of freight rates.

While the railroads have not yet announcedtheir position, it is intimated in well informed circles that ttheir view is:

That the failroads cannot afford to decreasc their revenue.

That they must be guaranteed that the de-creasc in rates will assure larger tonnage.

That freight charges are but a small part, in any event, of total cost of anything, of the complete house, for example.

Some thought should convince everyone.

That decrease in rates will enable thc rail-roads to earn a greater total of revenuc, than can be had from the present prohibitive rates.

That the logic of a reduction would be to stimulate all activity and consequently to progressively increase the tonnage to be carried.

That the contention that the element of freight is so comparatively small in thc total is not sound. The same claim could be made in respect to evry in gredient going into a building.

Lumber represents only about 8% of the cost of a representative building. No onc item (except labor) standing alone, represents a large per centage of the total.

The attitude of the railroads, if takcn by all, would mean that no reductions would be made; and this reduces the position to an absurdity.

Lumber is as low as it should be; to this allgree. Let the railroads reduce rates.

Let all others, who havc not reduced, do so at once—and let business activity get under way with full momentum.

W. M. Ritter Lumber Co., Columbus, Ohio

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300,000—Ft.—4/4 Com. Pl. Red Oak for flooring. Indiana lumber.
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50,000— " —4/4 Ists and 2nds. Chestnut Reg.
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We ship straight or mixed cars in all kinds of hardwood. Write for prices.

Service LHC *Quality*

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Prompt *Shipments*

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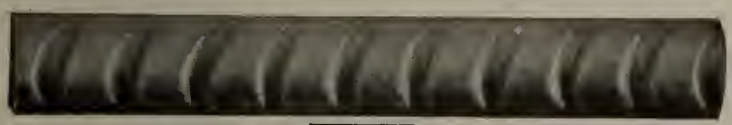
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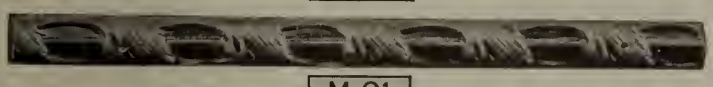
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M 73

MOULDINGS We are making more Period Mouldings than ever before. Orders should be placed early to assure your supply when needed.

KNOBS The Period Knobs we placed on the market a few months ago are proving very popular. If you have not received samples ask for them now.

ROSETTES A new Period item to accompany the knobs.

OP8 OP5 OP6

Waddell Manufacturing Company

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LUMBER and VENEER

Poplar Veneer

Quartered Oak Veneer

Loading Mexican Mahogany Logs in the Tropics.

DROP US A LINE WHEN NEXT IN THE MARKET

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E. R. Spotswood & Son

INCORPORATED

MANUFACTURERS OF

Kentucky Hardwood Lumber

We specialize in soft texture Kentucky Oak—Plain and Quarter Sawed, also in Ash, Basswood, Chestnut, Poplar, Beech.

Let us quote you on your requirements—our prices are right and we can make prompt shipments direct from our mills.

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Burns & Knapp Lumber Co.

Manufacturers of

Southern Hardwods

Plain White and Red Oak, Dimension Oak, Hickory, Ash, Chestnut, Poplar, Basswood, Walnut, Maple, Beech, Butternut.

CONNEAUTVILLE, ——————— PA.

We list below, items of our own manufacture, band sawn, that we are in a position to ship promptly.

1/2", 5/8, 3/4, 4/4, 5/4, 6/4 & 8/4 Quartered White Oak

3/4, 4/4, 5/4 & 6/4 Qtd. Red Oak

5/8, 3/4, 4/4, 5/4, 6/4 & 8/4 Plain Oak

4/4, 5/4, 6/4, & 8/4 Sound Wormy Oak

5/8, 4/4, 5/4 & 6/4 Plain Sap Gum

4, 5, 6, 8, 10 & 12/4 Qtd. Sap Gum

4, 5 & 6/4 Plain Red Gum.

4, 5, 6, 8, 10 & 12/4 Qtd. Red Gum

4, 5, 6 & 8/4 Tupelo Gum.

5/8, 4, 5, 10 & 12/4 Ash.

5/8, 4, 5, 6, 8, 10 & 12/4 Elm.

5/8, 10 & 12/4 Maple.

4, 5 & 6/4 Cottonwood.

MAY BROTHERS Office and Band Mills: MEMPHIS, TENNESSEE

ESTABLISHED 1867 INCORPORATED 1886

OTIS TRADE MARK

MAHOGANY

The King of Woods

The above photograph shows many thousands of feet of this regal lumber in our yards. Hewn from the jungles of the tropics, escorted along many miles of inland river to the sea, by chattering, singing black men, then shipped to our mills; this, in brief, is the story of the King of the woods. Mahogany.

WE ARE MANUFACTURERS AND IMPORTERS OF

Tabasco, Laguna, Honduras, and Mexican Mahogany

The Otis mills have a capacity of 12,000,000 feet per year. This assures our customers that we possess an adequate supply. Write for our quotations.

Otis Manufacturing Company

Peters Avenue and The River

NEW ORLEANS, LA.

Chicago Office: Room 208, 128 N. Wells Street

On October 17, 1906 the S. S. "Corinth" sailed from Axim, Gold Coast, Africa, to Pensacola, Florida, with the first full cargo of mahogany logs ever shipped from the continent of Africa.

Prior to 1860 complete cargos had sailed from Africa, but the holds were laden with human freights from which was manufactured the great American Civil war.

From the valuable cargo aboard the "Corinth" was produced the beautiful and the useful—a contribution to the prosperity and civilization of America.

To the successful venture of this pioneer ship is largely due the position and influence of African Mahogany in the wood artistry of today.

It is immaterial that the Mengel Company were the operators of this ship and the owners of this cargo.

THE MENGEL COMPANY
INCORPORATED
LOUISVILLE, KY.

THE PAST AND PRESENT IN MAHOGANY

PERIOD CARVINGS

for

FURNITURE

Largest Manufacturers of Imitation Wood Carvings in the World
Quality the Best — Prompt Shipment

Unlimited facilities for the manufacturing of high grade period wood carvings in composition and wood fibre. Reproductions of exclusive designs our specialty.

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THE DECORATORS SUPPLY COMPANY

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QUALITY

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The best time to buy, is—now. Prices are down. The next movement will be upward.

We are specialists in our field of activity, which means a high standard of Quality and service.

Manufacturers of

OAK - POPLAR - GUM

Memphis Band Mill Co.

"Quarter-Sawn White Oak Headquarters"

Memphis, Tenn. - U. S. A.

Efficiency Marks Every Step of Our Service to You

Exact photograph of alley in our yard

White and Red Oak

Plain & Quarter Sawed Red Gum

Our Specialty Quarter Sawed Red Gum in Plain and Figured Wood

From the cutting to the delivery to your hands, our entire stock receives the most careful attention. All the excellence of quality and the beauty of the wood is kept just as it is when cut. When next you are in need of Oak, Ash, Elm, and Cypress of first class quality and in perfect condition write us. We can ship promptly.

BARR-HOLADAY LUMBER CO.

BAND MILL AT LOUISE, MISS. **GREENFIELD, OHIO**

The Investment Behind the Brand

THE dominant element in the hardwood producing trade is the large operator with a long-time investment which justifies perfect equipment and methods.

The accompanying illustrations picture the four factors which are the buyer's guarantee of conscientious service and quality in the WISCONSIN LUMBER COMPANY products. These photographs are used together here for the one purpose of visualizing the extent of our investment involving a many years' timber reserve, a modern town, a thoroughly up-to-date sawmilling plant, and a complete logging outfit with many miles or standard gauge logging rails.

Considering the matter strickly as a business proposition, would it be logical for a firm with such a tremendous investment to give anything but the highest possible type of product and service in marketing its output? The great expense in merchandising is seeking new customers. It is our belief that old customers now on our books more than justify every legitimate cost in keeping them there. That conviction is responsible for the guaranteed WISCONSIN LUMBER COMPANY lumber without a board picked out and with every piece branded.

WISCONSIN LUMBER COMPANY

CHICAGO, ILLINOIS

BAND MILLS, DEERING, MO.

"CHICAGO MILL"
DIMENSION STOCK
FROM
SOUTHERN HARDWOOD LUMBER

Our Cairo, Ill., Plant Largest in Operation

Exclusively engaged in the manufacture of
DIMENSION STOCK
(Kiln Dried or Air Dried)

Dimension Lumber Kiln Dried Means:

1. **The elimination of waste.**
2. **A saving of at least 40% in freight.**
3. **Lumber delivered at the woodworker's plant ready for immediate use.**
4. **A quick turnover and minimum investment in lumber.**

The benefits to be derived from the use of Chicago Mill Dimension Lumber are cumulative. In the long run it means lower production cost for the finished article.

For particulars and prices address

Chicago Mill and Lumber Company

FROM
Sycamore
Ash, Elm
Oak, Gum
Cottonwood
Cypress, Maple

Dimension Lumber Department
111 WEST WASHINGTON STREET
CHICAGO, ILLINOIS

FOR
Furniture
Automobiles
Drawer Sides
Kitchen Cabinets
Garment Hangers

SOUTHERN HARDWOODS

Unexcelled Quality and Service

Prompt Shipment — Dry Stock — Uniform Quality and Inspection
Band Sawn and End Trimmed — Full and Uniform Thickness — Good Run of Widths and Lengths

Twenty-five years of service to the most exacting users of quality hardwoods enables Paepcke Leicht to help you get your exact requirements in southern hardwoods no matter what they may be.

This experienced service is impartial,—its purpose is to help you select the wood best suited for your use—uniform in quality and of the most economical grade which will prove entirely satisfactory for the job.

We Specialize in Oak and Gum

PAEPCKE LEICHT LUMBER COMPANY

GENERAL OFFICES—Conway Building
111 West Washington Street, Chicago, Ill.

BAND MILLS—Helena, Ark., Blytheville, Ark.
Greenville, Miss.

ESTABLISHED 1892 INCORPORATED 1916

ROBT. BURY & CO., Canada

LIMITED

1 Spadina Avenue, Toronto

Special Announcement to the Trade

We are now acting as Distributing Agents in Canada for the ***Waterville Veneer and Panel Company, Waterville, Quebec.*** The new plant is now fully equipped with three lathes and can turn out Rotary Cut Veneers up to ten feet long. The panel plant is one of the Best on the Continent, waterproof glue only being used in the manufacture of the ply wood. Panels can be supplied in any wood with Mahogany, Walnut and Oak faces. The Company will also specialize in a cheap 3-ply Panel built of Birch and will also make a specialty of Single Ply Veneers in Birch, Basswood, etc., cut to dimension.

Mail your enquiries to above address

Head Office and Veneer Warehouse
1 Spadina Avenue, TORONTO

Lumber Yard, Dry Kilns and Mill
Foot Spadina Ave., TORONTO

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Furniture Manufacturer

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Vol. 21 Toronto, June, 1921 No. 6

IT CAN'T GO ON.

A talk with a number of operators on woodworking plants could hardly help but convince one that, in an effort to secure business and keep their plants operating, many woodworkers are out after orders at any figure, utterly regardless of costs or profits. Instances are occurring almost daily which show the extent to which prices are being cut. The prominent sash and door man figured on a small bill of special sash and quoted $53.50 as his price. Later, on enquiring, he was surprised to learn that the order had been placed with a competitor who agreed to make the item for $34.00. This indicates too big a difference between quotations and, more than that, a careful checking of the estimate, figuring the mtaerial at present replacement value, shows that the lumber alone is worth $37. In addition to eliminating profit, throwing in all necessary labor, the successful bidder stood to lose $3 on the lumber used. Is that good business?

Another instance of the same nature is where a large woodworker, after careful figuring and after reference to cost figures obtained on similar work, quoted $1,750 on a bill of material for a house. A few days later he learned that a rival had undertaken the work at $1,335, a difference of $415. Checking his estimate did not disclose any errors, and by foregoing all profit, the best he could do was $1,575. Needless to say, the competitor secured the business.

The question arises as to what happened the successful bidder in each case. Did he make a profit? Did he know his costs? In each instance the high tenderer claimed to have based his figures on accurate cost records. That being the case, it would appear as if the concerns which undertook the work stood to lose on each transaction.

A manufacturing operation cannot be conducted at a loss and continue in business. Sooner or later the day of reckoning must come. tI is worth an effort and even a sacrifice of profits, if necessary, to keep the plant operating and the organization intact, but to throw discretion to the winds and cut, cut, cut just to beat the other fellow is an unwise policy to adopt, especially if guesswork happens to be the foundation of the cost figures, upon which quotations are being based.

There is only one intelligent way to conduct a factory, and that is to keep accurate cost figures, check them against costs and estimates and base all prices and quotations on the bed rock of knowledge. Several practical articles on this important subject are scheduled to appear in early issues.

Printers say: "Less work—more pay"

The employees in the printing and publishing offices in Toronto struck June 1st, as predicted in last issue.

They asked $44 for a 44-hour week, an increase of 36 per cent.

They were offered $36 for a 48-hour week—a little more than they received last year when the cost of living was at the peak. This was refused.

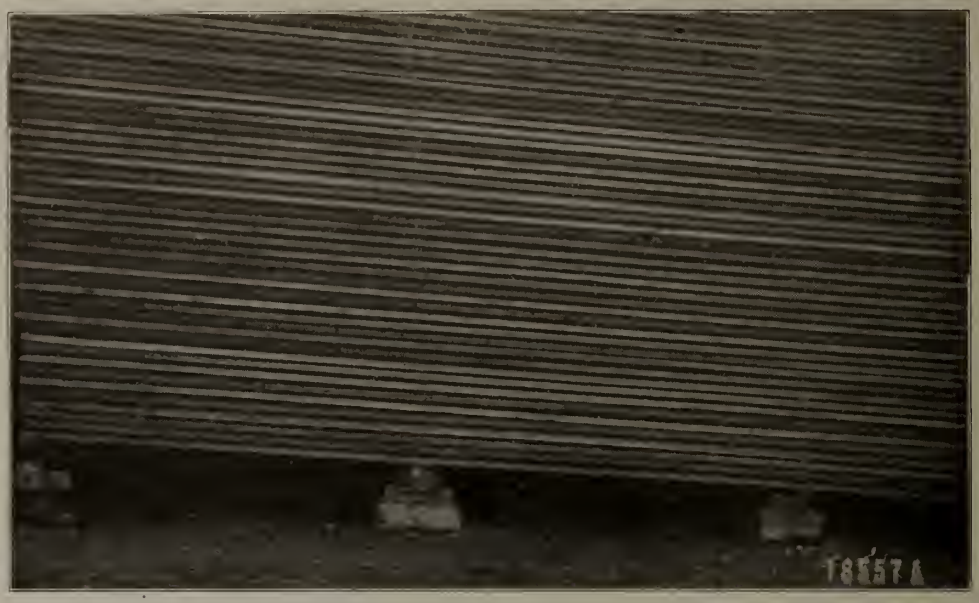
The publishers and master printers believed it to be their duty to protect the buyer of advertising and printing. The strike of union printers is the result.

Think of it—less work and a lot more pay at a time when it is most essential to increase production and get back to normal.

Unreasonable wage demands and shop rules which place employers at the mercy of the unions must be checked.

This issue is late. Others may be late or be suspended entirely, but we do not propose to yield until a fair settlement has been forced.

The battle, dear reader, is yours as well as ours. Be considerate.



Careful piling will keep lumber straight

Saving Dollars in Your Lumber Yard

How Percentage of Lumber Waste is Increased in Some Plants by Careless Methods—Observance of Simple Rules Would Eliminate Loss—End Checking May be Prevented

By R. N. Dormer

THE storage and handling of lumber so as to prevent loss from deterioration, checking and warping, is a subject with which all woodworkers should be familiar, yet a walk through the average lumber yard would tend to convince anyone that the very simplest rules for the handling of lumber are not being observed. This may be due to carelessness or lack of knowledge, but whatever the cause, vast sums of money are being lost annually through the deterioration of lumber stored in the yard.

Excessive warping due to lack of sufficient number of stickers and foundation timbers.

This fact was forcibly impressed upon the writer recently when visiting the plant of a well-known furniture manufacturer. The factory in question is supposedly modern in every respect both as regards to the equipment installed and the methods employed; yet in their storage yard lumber was being deliberately spoiled and degraded.

How Lumber is Wasted.

The most glaring fault noticed was that they were using five rows of stickers on a three-skid foundation. Thus the two centre rows of stickers did not have any bearing or support underneath and as a consequence the first ten or fifteen tiers of lumber were badly warped between the end and centre stickers. This was not an individual instance, but seemed to be applicable to the majority of the piles in that yard. Another doubtful practice noticed was that boards of random lengths were all piled in one pile. The long over-hanging ends naturally hung down and set in that position. Half a dozen piles handled in this manner might mean a loss of from one hundred to several hundred dollars, depending largely on the value of the stock and the purpose for which it is to be used.

There are a number of rules for piling and storing lumber, the observance of which would, without adding

to the cost of handling, go a long way toward reducing the loss occasioned to lumber while in storage. Such defects as warping, checking, discoloration and decay may be controlled and to a large extent eliminated through proper common-sense methods of handling.

Decay in lumber is due almost entirely to low forms of plant life, commonly known as fungi. These develop rapidly in most places where there is little or no ventilation, and when once formed spread very quickly. Thus in lumber piled solidly, or stacked in such a way that there is little chance of adequate ventilation, deterioration due to stain and decay is apt to be very rapid. The same holds true of lumber piled directly on the ground. The first few tiers are apt to be damp all the time and offer a favorable opportunity for the development of these destructive fungi.

Good Foundations Important.

This brings us to the foundations on which the lumber piles are built. In constructing foundations in lumber yards two features should not be overlooked. One is that the foundations must be built sufficiently strong to carry the load, and the other is that provision must be made for a free circulation of air in and around the foundations themselves and through the bottom of the piles of lumber. In constructing these foundations, it must be borne in mind that these fungi travel along the surface of the wood, so if a wooden foundation is employed, the timber used should be sound and free from decay and kept well above the ground so that it will remain dry. Combination foundations of concrete tiers and wood or concrete and old rails are very satisfactory. A sufficient number of cross skids should be provided so that each row of stickers rests on a solid base and so that provision is made for a row of stickers at the extreme ends of the pile. Usually the front foundations are higher than the back. This is to provide a slope to carry off the rain aind other moisture that may collect. The sticks should be placed not more than four feet apart for softwoods and as close as two feet for certain hardwoods which warp and twist freely.

Piling random-length material together in one pile, results in excessive warping from two causes. The over-hang of the longer boards, being unsupported, naturally drops down and dries in that position. The dropping of the outer end acts like a lever and causes a reverse bulge or curve between the first and second rows of stickers. This in turn might cause a reverse bulge between the second and third rows. Thus not only is the end of the piece dried out of shape but another section inside the first sticker is badly kinked. As far as practical, it is advisable to keep all lengths

How unevenly spaced stickers cause warping

together and pile them separately, making sure that a row of stickers supports each end.

Pile Should Have Forward Pitch.

In making the pile it should be given a forward pitch of at least 1 inch to each foot in heighth. This allows the rain and water, that would otherwise work into the pile, to drip directly to the ground. Careful spacing of the boards in each row is an important consideration. Unless sufficient space is provided, ventilation of the pile will be seriously retarded. Free ventilation tends to dry the lumber, remove any surplus moisture that may seep into the pile and eliminate the tendency to stain and discolor. For 1 in., 1¼ in. and 1½ in. lumber a space of not less than ¾ in. should be left between each board; for 2 in. and 2½ in. stock the space should be 2 in. and for thicker material resort should be made to 3 in. spacing.

The stickers themselves are worthy of attention. Some firms are very particular about the stickers used, while others seem to think that any old strips are good

Oak piled with stickers placed two feet back from ends of pile. Note end checks.

Note position of front stickers and total absence of end checks

enough. In the first place they should be of uniform thickness. This means surfaced. It is better to have them of uniform width, not less than 2 in. In length they should be slightly longer than the width of the pile. If the stickers are uneven in thickness, the pile will be high in one place and low in another, resulting in crooked stock.

The importance of placing the stickers in regular rows directly above each other should be too well known to need reiteration, yet how often does one see a pile where, due to carelessness—for it is nothing else—the stickers are placed anywhere but directly above each other. When this occurs, excessive warping is bound to result. This is plainly shown in some of the accompanying illustrations. To insure straight lumber, every attention must be given to the selection and

Warping due to the piling of uneven lengths of lumber together.

placing of the stickers. Not only must they be kept in line but each row should rest on a cross piece or skid. This was explained early in the article.

Preventing End Checking.

The stickers should be placed at the extreme ends of every pile. The advantages of this are threefold. They support the ends of the stock and prevent warping. If allowed to protrude slightly beyond the ends of the boards they shed the rain, help keep the pile dry and tend to prevent end-checking by retarding the rate at which the end wood dries out. The weight of the stickers and pile bearing directly on the ends of the lumber tends to prevent the stock contracting with the accompanying checks. Two of the photos shown illustrate how the placing of stickers at the ends of the lumber reduces end-checking. Under no circumstances should lumber be piled in the open without stickers of some kind being used.

In a yard where any considerable quantity of lumber is stored, the amount of material used for stickers runs into many thousands of feet. In view of this it is doubtful if the value of the stickers is fully realized. The writer knows of instances where the children, and even the employees themselves, think nothing of breaking up a few dozen pieces and carrying them home for fuel. In a yard where there are 40 or 50 piles there may be as high as 20,000 feet of lumber in the stickers themselves. There are some who place a true value on this seemingly unimportant item and as a consequence have constructed covered racks and even sheds where the stickers may be carefully stored when not in use. If left lying around on the ground they become warped, twisted and broken. If left long enough decay may set in. Thus the pile in which they are used may become affected.

All piles in storage should be covered in some way to protect the upper layers from the action of snow and rain and to shed as much water as possible. Lumber exposed directly to the weather quickly checks and warps and is thus often rendered practically useless. Loose boards of low value are often used for covering purposes. They are held for this purpose entirely and employed over and over again.

The spacing of stacks is also very important, as upon the clearance allowed between piles depends to a certain extent the circulation of air through the lumber. No less than 2 in. should be allowed between each pile and this space might well be increased if the area of the yard permits.

Protecting Ends of Hardwood.

Where heavy hardwood is being seasoned in the open it is advisable to protect the ends in some way either by nailing cleats or pieces of metal over the ends or by treating them with some moisture-resisting compound. Many feet of valuable stock will be saved if this is done. The ends may be treated with paint or one of the following formulas might well be used: Rossin, 60 parts; lamp black, 1 part. This should be applied hot. Another mixture can be made from whitewash, glue and salt.—1 quart of glue and 3 lbs. of salt to half a barrel of whitewash.

In conclusion, every week should be clean-up week in the lumber yard. As intimated, the fungi, which cause decay, spread rapidly so that pieces of decaying wood coming in contact with a pile of lumber might affect a large part of that pile and cause considerable loss. Wherever possible, the yard itself should be covered with a good layer of cinders, not ashes. Certain chemicals contained in cinders combine and produce sulphuric acid. This acid tends to kill all plant growth around the piles and in the yard, while on the other hand, ashes themselves tend to promote plant growth.

Every woodworker has so much money tied up in his lumber yard that he cannot afford to overlook any simple precaution that will tend to reduce loss and conserve the lumber purchased.

The Valley City Machine Works, Grand Rapids, Mich., manufacturers of this machine, will be glad to furnish further information on request.

The National Cooperage Co., Limited, Toronto, was recently incorporated to manufacture and deal in barrels and all kinds of cooperage; capital $1,000,000. W. F. Lickley and G. H. Bourne, both of Toronto, are two of the incorporators.

100 Woodworkers Discuss Motor Drive

Pointed Opinions by Operators of Woodworking Plants on Suitability of Electric Drive—Reasons For and Against—Has Won Large Number Supporters

"The electric drive has so many advantages that steam is unthought of and the consequent accumulation of shavings can be cared for by a Dutch oven and your power may be transmitted without costly belts and cumbersome line-shafts. Its cheapness is obvious from a glance at your cost per horse power."

"On account of the poor water we are obliged to use, we consider it advantageous to use electric drive, and besides it is a very true, steady power that we would not consider it to our gain to change to steam. The cost is approximately the same."

"No matter how heavy a load, there is no variation in the speed at which the machinery is driven by an electric motor, whereas with steam there is a slowing down when heavy machines are put on. Another advantage in favor of electricity is that one can always tell exactly what the power is going to cost."

"We find that the greatest advantage is in reducing the friction or in other words the lost power. In the woodworking plant alone we have reduced our friction from 45% to 15%."

"Advantage all in favor of electricity if supply is steady."

"Formerly we used a steam-driven 60 horse power boiler, 35 horse power engine, but now a 15 h.p. motor drives all our machines at full working speed, something we never could attain with steam."

"Prefer electric drive, cleaner, handy to operate and cheaper."

"Electric very much cheaper."

"Individual drive advantageous as one part can be shut off without interfering with other machines."

"Prefer electric for part, steam for part, as steam is necessary for kiln-drying purposes."

"I much prefer electric drive, providing we could obtain it at a flat rate."

Eliminates Transmission Lines

"The inefficiency of the lineshaft — countershaft style of drive has been recognized in recent years by a good many manufacturers on account of the great waste of power in transmission. In a well-equipped factory with lineshafts driven by belts, the loss of power in transmission and friction will be at least 25 per cent., and in plants not so well equipped, it will run as high as 40 per cent. of the power generated. This loss is practically all eliminated by using electric motors direct-connected to machines."

"For a woodworking plant where fuel is plentiful, we favor steam."

"Electric is alright. I feel, however, the rate is too high (50 h.p.)"

"The steam is a thing of the past where you can get the electric drive. You have no waste time or power. We find it suits our needs the best."

"Electric drive is very much cheaper."

"Prefer electric drive for economy and convenience. Disadvantage only when power is off."

"Electric drive more economical."

"The electric drive is far ahead, providing there are no shut-downs."

"Electricity more convenient, largely eliminating belting and enables one to place a machine in any position regardless of shafting. We generate our electrical energy for power and light with a "Hydro" connection, giving partial power and light for emergencies."

"Find electric cheaper than steam."

"Motor saves engineer's wages."

"Electric drive has nearly every advantage over steam drive."

"Electricity cheaper on account of high salaries for the engineer."

Safety Factor Considered

"We consider electric drive more economical and much safer, especially when wastage is taken care of and made of some commercial value."

"We consider electric power far in advance of steam for several reasons,—1st, not necessary for engineer; 2nd, No coal to buy; 3rd, No upkeep as compared with engine."

"I like electricity because it is always ready and is cheaper than steam for my factory."

"We use a few motors intermittently for convenience; have not power enough for continuous service; use steam principally made from refuse."

"Favor the electric drive. There is no waste power and a small plant does not require a night watchman."

"On account of coal being so high in price and other fuel also expensive, the saving in a motor drive is considerable. The saving of a man's time looking after the engine and a saving of oil as motor will consume only a small amount to what an engine will."

"We find electric drive superior."

"Saves engineer's wages. No trouble with water-pipes freezing."

"We wouldn't go back to steam power on a bet."

"We find the electric drive more economical for isolated drives and for our machine shop which is often required when the engine is shut down. The method of charging a minimum rate per h.p. installed by the Hydro, practically prevents individual motor system of installation for plants such as ours."

"As we produce enough fuel (shavings) to develop to capacity in steam on present installed power, we, of course, find it more economical to use steam. The addition of electricity is to take

care of special moulding department. For us, steam most reliable."

"Electricity the only power."

Generates Own Current

"We find it much handier using the motor drive instead of steam drive, there being no power wasted so to speak. When a man is through with a machine he shuts his motor off and there is no idle transmission running to eat up power. It has done away with practically all overhead belting, etc. We find it cheaper to generate our own power as we have to have the steam anyway for heating and for our dry kilns. We purchase a little power but not of any account. We even use our own lights but have it arranged so that we can switch in Hydro lighting service after hours when our generator isn't running. All around, we believe it to be more satisfactory and more economical than steam."

"Much handier and cheaper and always ready."

"We find the electricity much cheaper and handier to operate than steam."

"We strongly say 'Electric' after many years' experience with it."

"Electric power is cheaper and steadier, and reduces fire risk."

"The disadvantage of electric drive is getting rid of refuse."

"Electric much the best."

"Electric motor has advantage over steam in part of our plant where used on account of saving in fuel and labor, but would not be an advantage in other parts of plant as when steam power is generated, it makes its own fuel."

"Electric power economical if used 24 hours. In our particular case all exhaust steam is utilized."

"Electric is preferable but steam is used to burn up refuse, etc."

"Advantages are all in favor of electric drive."

"No comparison whatever. Hydro power is the only power going as to cost and service."

During last four years has been much more satisfactory as well as economical."

"Electric drive is good when motion is constant but for sawing where load is on and off, steam is better."

Frozen Pipes Thing of Past

"No fire menace, no trouble with water-pipes freezing in cold weather and less labor and trouble with electric drive. Only disadvantage is that it provides no way of disposing of sawdust and planer shavings which would be used as fuel with steam drive. Of course a burner would take care of this."

"Electricity cheaper. More convenient, fewer interruptions."

"We have only recently discontinued steam drive and have installed electric. We find a much more steady drive, also more power."

"Motor drive on grouped machines requiring power only for machines actively in use saves on transmission line and whole plant is less liable to shut down on account of breakage. Would have to find other means for disposing of shavings, etc., which are now burned."

"No comparison, labor and fuel, nil."

"Would not return to steam under any consideration."

"Electric drive is much more advantageous and cheaper than steam at the present time."

"No comparison."

Loads Motor to Capacity

"Electric best and cheapest if you run your motor pretty near to its full capacity. We are using about 28 h.p. out of our 30 h.p. motor."

"During warm season hydro is the cheaper. In winter we might use engine cheaper, using live steam for power and exhaust for heating, drying, etc. Hydro is, certainly, more convenient and on the whole is the best power."

"Group motors or individual, is the very best for woodworking plants, where special furniture is manufactured. Steam must, of course, also be had for kiln and glue-room heating, etc."

"Advantages of electric drive: more even, less danger of fire, saves labor of one or two men."

"It is cheaper and always ready."

"Electric drives are more direct, more flexible but in considering removing waste, kiln drying and heating we save money on our steam plant."

"Would not consider steam at all."

"No experience as yet but think we could cut down power bill some, even having to provide steam for kilns, heating presses, etc."

"Electric drive suits my machinery better than steam, as it is all light high speed machinery and is, I think, less expensive."

As a Part Time Power

We have contracted with the Hydro for eight months in the year commencing April 1st, to November 30th. The balance, four months, we go back to steam. The reason is this,—we have got to have steam to heat our plant. We expect to have enough offal to run our steam plant till February 1st. This will mean we only need to buy soft coal for the remaining two months, whereas we were buying and burning coal all the time for 12 months in the year."

"The electric drive the only one. We would not use steam power even if coal could be obtained at $5.00."

"Small users electric is best. More convenient."

"Advantages of electric drive—economy of power. We have occasion, under present conditions, to run our auxiliary steam engine for one or two machines, which, under electric power, could be avoided."

"Electric drive much better in every way."

"We strongly say 'Electric' after many years' experience with it."

"Much cheaper and more convenient than steam."

Eliminates Fuel Problem

"I consider electric drive a great advantage owing to the ease with which it may be started.

Also there is no trouble in obtaining fuel, which is necessary in any other form of power."

"We have given the electric trial for one year. Although we have not as yet come to any conclusions, facts seem to point towards steam being the most efficient when as in our case we can use the exhaust steam from the engine to heat our kilns and factory." (165 h.p.)

"We like the electric drive, but service charge for large motor seems quite high, $40 per month if motor is not used, about $32 if motor is used. We use water-power to assist motor when there is a supply of water available."

"We believe the electric power is best and cheapest but as we make large quantities of refuse, we are compelled to use steam. We also need it for kiln-drying and heating the factory."

"Electric has many advantages, but not sure yet that it does not cost more than steam for a woodworking plant in winter work. In summer there should be some saving."

Cheaper Than Steam

"We use the motor on our double shavings fan only, which requires 20 h.p. indicated and which costs us about $18.00 to $19.00 per h.p. per year. Our cost of steam power is much greater, at least $50.00 per h.p., but a certain amount of steam is required for other uses in the factory."

"We find electrically-driven more advantageous in every way. Has cut our power and heating cost 42 per cent. since 1917."

"Electric power cheaper and more efficient. Only use steam to use up wood refuse and make enough exhaust steam for heating dry kilns and building."

"We prefer electric power. It is so handy."

"Owing to fuel being high, the difference in the cost of Hydro and steam we believe would pay for installing Hydro, in two years."

"Much cheaper than steam, notwithstanding we used shavings for fuel, which cost us nothing. Although we are charged $1.00 per h.p., it does not cost us that. We pay what meter shows. Can stop or start when we choose. No power used, no charge, except the base charge 12.5 per h.p. Very satisfactory."

"Very much better and cheaper."

"We find electric drive much cheaper and convenient."

Few Disadvantages

"Altogether in favor of electric drive."

"At the present price of coal, electric power is cheaper but is very unsatisfactory due to the endless shut-downs ranging from 5 minutes to ¾ hour."

"There is a great advantage in electric drive. It is a money-saving power."

"Have never used steam drive. Electric pow-

"Electric drive does not require a man in constant attendance as does steam. Starting is instantaneous and does not require an expert. Any one of the workmen can throw in the switch and get the line-shaft under way. To our way of thinking it has all the advantages and no disadvantages compared to steam."

er always ready. Needs very little attention. It is cheap."

"Electric drive much more convenient than steam."

"About two-thirds cheaper than gasoline power. Never used steam."

No Time Lost Getting Up Steam

"We find that steam is not in it with electric drive. No engineer. Start and stop any time. No waiting for steam to get up, and our experience is that there is less stops with the motor for repairs than an engine."

"Disadvantage you have to pay whether you use any current or not. Our plant only runs part time."

"We find in our business the electric power is far ahead of the steam, as the power is there at all times. Anyone can start or stop. No need of keeping a man and again there is not the danger of fire. We might say we would not change back to steam under any circumstances."

"The cost is less than we paid our fireman under steam. Great convenience for a woodworking plant which may not be running steady in slack season. (40 h.p.)"

"I consider the electric drive the best. We use it at our sawmill but we cannot use it in our factory as we are situated in a small village and cannot get refuse disposed of unless shipped. The freight prohibits that. A motor to each machine is the proper application.

Unusually Low Upkeep

"Would say with electric power available and the rate that is charged here and the service we are enjoying, we would not consider steam at all as electricity is by far cheaper to operate. The expense of upkeep is nothing compared to steam. The cost of operating in our plant is less than fireman's wages. (35 h.p.)"

"Cleanest, cheapest and handiest."

"As long as dry kilns using steam are necessary, we believe it will be to our advantage to use steam power largely and use the exhaust for heating."

"We consider the electric drive more economical, especially when the shavings and sawdust can be disposed of to advantage. It is also not as hazardous regarding fire."

"We prefer electric and save practically 200% operating expenses. (150 h.p.)"

"Much more economical, as it saves an engineer's wages, etc."

"Would not consider steam drive. Electric drive much more economical and by far the most efficient and satisfactory."

"Less labor, no fuel, cheaper."

"We get sufficient refuse to make the necessary steam, and as steam is required for heating shop and dry kilns and we use exhaust for this, would not change steam for hydro in our line."

"No comparison to steam drive. No coal, no man to throw coal under a boiler."

Plans for an Eight-Room Residence

Designed by P. H. Finney, Architect, Toronto

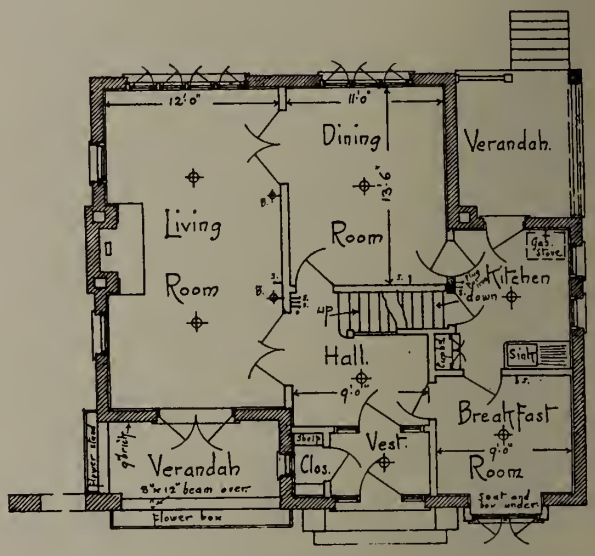
THE accompanying floor plans and elevation are of an eight-room house under construction at the present time in the Beach district, Toronto. The house is built on the square plan, red tapestry brick being used in the construction of the walls to the second floor, with stucco on frame above. The exterior appearance of the house is very attractive, the simple square plan being broken by the sloping roof, as shown in the elevation, which projects out at the corner of the house, forming a hood over the side entrance way, yet the ultimate floor space is maintained. The wood casement windows also add greatly to the beauty of the exterior. The house is roofed with wooden

Front elevation.

shingles, stained dark green. There is a small square verandah at the back entrance, with a balcony above, entering on the sun room on the second floor.

There is a basement under the entire ground floor, which contains a large billiard room, separated from the rest of the basement by a 9-inch brick wall, with an entrance opposite the stairs. This room is located just under the living room, shown on the first floor plan, and is exactly the same size. Entrance can also be gained from the outside, at the rear of the house. There is ample accommodation also, for heating equipment, coal bins, laundry tubs, etc.

A feature of the main floor plan is the easy access which can be had to any of the rooms from the square hall. This floor contains a large living room, 22 ft. x 12 ft., dining room, kitchen and breakfast room, oak floors, and trim being



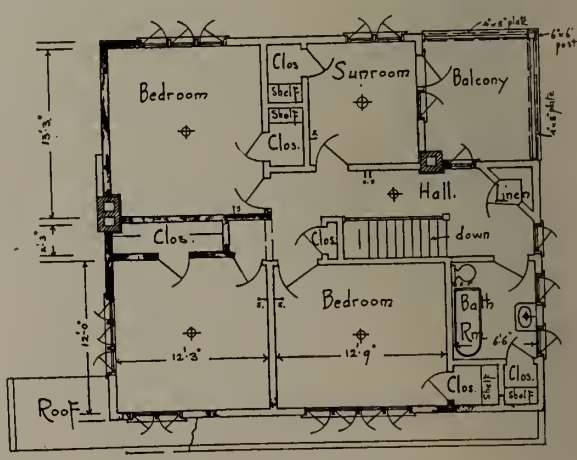
Ground floor plan.

used throughout, with the exception of the kitchen.

In this particular case, only a small kitchen was required, but it will be readily seen that the kitchen space could be very easily enlarged, if necessary, by taking in some of the roomy porch at the back.

The three bedrooms and sun room on the second floor are laid with hardwood floors and trimmed with Georgia pine. Tile will be used in the flooring of the bath room. As will be seen on the plans, the bed rooms are all large, well arranged and well lighted. The house is steam-heated.

Mr. P. H. Finney, 79 Adelaide St. E., Toronto, was the architect.



First floor plan.

To Distribute Burden in Good and Bad Times

Normal Overhead Best Basis for Figuring Costs--Does not Penalize Business when Production is Low—Each Year Dependent on Others

By E. W. McCulloch.

In the article "What a Cost System Should Do for You," which appeared in the May "Canadian Woodworker," we called a good system an insurer of profits. Some may question this statement in times of depression when they find their unit costs rising 100% or more, largely because of the increasing overhead on their low or sub-normal production. Let us examine the situation by calling to mind those facts and fundamentals with which we are familiar.

A manufacturing enterprise in its simplest terms consists of:—

(a) A place to work,
(b) Machines to work with,
(c) Men to do the work,
(d) Material to work upon,
(e) And management to co-ordinate the whole.

Let us see what all this means. A place to work requires maintenance. It must be repaired and cleaned, heated and lighted and watched. A place to work bears taxes, rent and insurance and it also depreciates. Machines consume power and supplies, require insurance, attendance, repairs and cleaning and also depreciates. Men to do the work entail wages, liability insurance and supervision. Materials include provision for receiving, sorting, handling and shipping. Delivery of material alone may demand a heavy investment in trucks and garage, teams, waggons, and stable, forming, in fact, a compact separate miniature organization. Management takes care of the buying, selling, financing and administration, purchasing agents, salesmen, accountants, stenographers, stationery, postage, telephones, legal expenses, engineering, advertising, travelling, and so right down the line of what are known as general or commercial overhead expenses. Such is your manufacturing enterprise in crude outline. Elaborate it, departmentalize, unify and combine it, as suits your own requirements.

The Activities Involved

That which gives life and vitality to your manufacturing enterprise is work,—something to do. It stirs the slumbering organism into action, starts the wheels a-grinding, the chimneys to smoking. How much work you can turn out,—what are the latent possibilities of your organization, — that is not often shown or demonstrated. Ordinarily your plant is idle sixteen hours out of twenty-four, and a day and one-half out of seven. Only in a great national crisis or emergency such as the recent war do we really speed up production and extract from our facilities the last ounce of usefulness. Otherwise we strike a steady normal gait of healthy activity below the limit of what we can do, above the limit of slacking or lagging. This normal, this mean or middle ground of possible capacity, is an ever-present fact in industry. It is there and should be recognized as a starting point in the discussion and treatment of industrial problems such as costs. Normal capacity is your 100 deg. mark, above which your organization registers in times of excessive or unusual activity, below which it drops in times of curtailed production and demand.

Operations Cease, But Do Expenses

The even flow of work is subject to many interruptions. There are strikes and transportation tie-ups, machinery breakdowns, seasonable fluctuations, as in the ice business, and years of light demand, such as we are at present experiencing. What happens when there is no work or little work? Do the expenses incident to running a business cease or recede accordingly? Your building still carries its taxes, rent and insurance, and needs about the same degree of repairing, heat, light and watching, and meanwhile it depreciates. Likewise your equipment continues to depreciate and requires insurance and some maintenance. Theoretically you can discharge your men, but practically you find odds and ends of work, non-productive tasks, for the best of them, and of course you retain your superintendents and many of the foremen. You stop feeding the machines materials, but your money is still tied up, and the material deteriorates, and must be insured, properly stored and cared for. When it comes to the management, you cannot sacrifice your executives, your office, your best salesmen, your best engineers, accountants or clerks. Such are the considerable expenses incident to not doing business; expenses which go on for a considerable time whether or not you are doing a dollar's worth of business or work, expenses that must go on if the organization is to remain intact.

Who Pays the Bill?

Since such interruptions of industry are still an ordinary incident of business, and carry a cost that must be reckoned, the business man hopes the consumer will pay for them. "I am offering a service to the community," he says. "If for considerable portions of time my facilities are unutilized, my plant and equipment idle, or marking time, I must include in my price an allowance for this item of suspended operation (inoperative contingencies the paper industry calls it); otherwise I cannot exist." Where facilities are based and attuned to the needs of the market, and are not a war-time mushroom growth, the demand of the business man does not appear unreasonable. The trouble very often is that his cost system does not show him how he can recoup such losses.

When the very considerable expenses of not doing business are applied in full to a reduced activity, very high costs result,—costs out of all relation to the true costs of production, and costs bearing no relation to what the market will bring. In such time two opposite tendencies develop. On the one hand the business man who is a firm believer in his cost system refuses to take business except on a basis of his inflated costs and thereby further restricts business at a time when the crying need is for more and not less business. The

*Manager, Fabrication Production Department, Chamber of Commerce of the United States.

more skeptical business man feels there is something wrong with his cost system, proceeds to ignore it and sells his product for whatever he can get. This treatment of the cost system is more largely responsible for demoralized markets and prices than is realized. Meanwhile the plant is bearing the full brunt of slackened activity.

Normal Year the Standard

Our cost systems are far too rigid. Under cost methods still largely in use overhead expenses are spread too thin in times of forced production and, massed too heavily in periods of slight demand and production, giving in the former case costs that are artificially low and unfair to the management, and in the latter case costs that are artificially high and unfair to the public, and moreover costs which the market will not sustain.

For the sake of convenience, we split up our business into years and treat each year as though it were separate, distinct and unrelated, whereas no such sharp cleavage exists. Year merges and glides into year, one dependent upon and connected with the other. The injustice and inaccuracy of a complete and abrupt cut-off is clearly illustrated by an income tax law which heavily taxes the profit of one year, and makes no compensating allowances for the losses of the following or preceding year's operations.

Cost systems should recognize this continuity of time wherein any single year or month may or may not typify and represent normal production and demand. There are expenses, it has been shown, which continue whether the plant is idle or in operation, expenses that moreover, bear no direct relation to output. Cost systems should provide that these expenses, usually designated as overhead expenses, should be absorbed and pro-rated on the basis of a normal year, —that 100 deg. mark on the business thermometer. Thus, in time of unusual production,—production exceeding normal,—the overhead should be more than used up in costs, and a surplus out of overhead cost created to take care of those years when the output is below normal and the overhead charges not fully absorbed in the costs of that year.

To take a very simple illustration: Let us assume the normal output of a department is 100 pieces and the overhead $100, or an overhead charge of $1 per item. If the department produces 150 pieces at a normal overhead charge of $1 per item, not only will the $100 overhead be used up but there will be an additional $50 as a reserve accruing to the management. When the output of the department drops to 50 pieces, only $50 overhead will be applied to this reduced production, and the difference made up from the reserve established during unusual production. This method of cost procedure has numerous advantages, two of which it is here appropriate to mention.

1. It will assure the business man a reward for his efforts in speeding-up.
2. It will eliminate the needless throttling of business by the impractical attempt to load semi-normal production with greater charges than can or should be borne.

Operation Under Normal Year Basis

The determining of a normal year is not an easy matter. It requires a long look behind and a far look ahead. It is by no means sufficient to accept the operations of the preceding year as the sole standard. The normal year is different for a new organization or industry from what it is for one long established. The normal year does not remain on a dead level but should probably curve upward gradually and conservatively with the growth of population and markets. To do otherwise would indicate industrial stagnation.

To establish normal unit overhead charges, two things must be determined:—

1. Normal overhead expenses for the various departments of the business.
2. Normal production.

When the normal overhead expenses are divided by the normal production, the result is the normal unit overhead charge.

In determining normal overhead expenses, those expenses of the previous years which are accidental should be eliminated. An effort must also be made reasonably to anticipate and allow for the trend of expenses for the coming year.

But there is nothing conclusive, final or binding about this estimate of normal expenses. Each month your cost system gives the estimated overhead expenses and the actual expenses. If there is an increase of the actual over the estimated, and upon analysis that increase is found to be a real increase, due to unanticipated increase of salaries or insurance rates, etc., and not an inflation arising from reduced production, an adjustment upward can immediately be made in the unit overhead charges. Each concern will establish for itself a safety zone, below or above which decreases or increases in real costs will be reflected and taken up in the selling price.

In determining normal production due allowance must be made for interruptions of operation. Even in the job industries, which by necessity have been schooled to base overhead charges on a normal year, the tendency is still to base capacity on regularly operated machines. When these machines do not regularly operate, it is apt to go hard with the establishment. In a paper mill with a possible yearly operating time of 7,488 hours, the plant was idle 689 hours or not quite 10% of the time, because of the usual and customary interruptions, repairs and high water. How transportation tie-ups, strikes, and slackened demand in many industries affect production is, of course, familiar to all. In determining normal production, then do not delude yourself by placing it too high,—at a mark reached only in exceptionally fortunate years.

Necessary Cost System Adjustments

Though cost accountants and industrial engineers are prone to using strange and technical terms for it, the accounting device used to secure operation on a basis of a normal year is the now familiar one of the Reserve, or a modification thereof.

For purposes of illustration, let us recall how a simple reserve, such as the reserve for bad debts, operates. The operating account "bad debts" is debited each month with the estimated amount of bad debts likely to be sustained, and the account "Reserve for bad debts" credited each month with a like amount. As bad debts are actually sustained, the amount thereof is debited to the Reserve for Bad Debts. It is very easy to ascertain for income tax purposes the amount of bad debts actually sustained during the year by referring to the debit side of the Reserve for Bad Debts, and ascertaining the estimated allowance for bad debt by referring to the credit side of the Reserve for Bad Debts.

So the estimated normal overhead expenses will be charged into costs upon the particular cost method

employed (man-hours, machine-hours, productive labor, etc.,) and likewise overhead expense will be debited to the particular expense accounts, and closed out periodically to the Reserve for Overhead. Accordingly, the debit side of the Reserve for Overhead will give the actual expense totals, and the credit side the estimated expense. It is assumed such a reserve for overhead will be sub-divided in accordance with departmental requirements, and where convenient the expenses will be scheduled.

The preceding has, moreover, left out of consideration refinements recommended by cost accountants of the principle of the Overhead Reserve, such as Under- and Over-earned Overhead or Burden, Overhead or Burden Variance, Supplemental Rates, etc. These do not disturb the essential principles set forth and are apt to confuse a simple presentation of them.

Some Misunderstandings Clarified

Certain misunderstandings arise concerning the distribution of overhead expenses on the basis of normal year which should be mentioned and disposed of.

1. The setting up of estimated overhead charges based on a normal year does not mean the abandonment or compromising of actual overhead costs.

The actual expense exists alongside of the estimated and one is compared with the other differences analyzed and accounted for. To an executive such an analysis reveals the story:

(a) Of inefficiencies that must be eliminated;

(b) Of advances or decreases in costs not anticipated;

(c) Of costs artificially low or high because of sub- or abnormal production.

A cost system is built for service, not admiration, and must furnish information that will guide and temper the entire policies of an enterprise. At a time when more and not less business is needed, a cost system that literally interpreted, instructs an executive to refuse business except on prohibitively high and inflated costs of production, falls down when most needed. Such a system, though arithmetically correct, presents results that are misleading and which may work serious injury. Accordingly, the actual overhead charges are checked, corrected, supplemented and eased by the estimate of expenses based on the normal year.

2. It is not the intention to forego or wipe out a single dollar of overhead expense that can be legitimately and fairly charged to operation, sales or administration.

That the management should bear the expense of sub-normal production is a point that has been stressed altogether too exclusively. Meanwhile not sufficient emphasis is given to the converse; namely, that the management should be rewarded for abnormal production. One is as fair as the other.

The balance in the Reserve for Bad Debts is not customarily closed out to Profit and Loss at the end of the year, but carried forward into the next year's operations, since any one year may or may not be typical of the bad debts normally sustained. So likewise the production of any one year may or may not be normal, and the balance of the Reserve for Overhead, be it debit or credit, should accordingly be carried forward. If the estimate of normal capacity is reasonably low and cautious, such overhead expenses as have not been absorbed in one year will be absorbed and the losses recouped in the years of exceptional production, for in the long run the depth of the depressions will very nearly equal the height of the peaks.

Found Feasible in Practice

What has been stated is elementary and suggestive. Its aim is to stimulate interest and encourage such changes as are necessary to meet progressive competition. The subject has been brewing for some time. It is referred to in the pamphlet of the Federal Trade Commission, "Fundamentals of a Cost System for Manufacturers," published in 1916, and to its development numerous well-known cost accountants and engineers have contributed. Upon inquiry of the Fabricated Production Department, establishments in such widely separated industries as paper, cutlery, envelopes, stoves, and metal products are operating on the basis of a normal year and upon this basis distributing overhead.

It will be useful to quote from the practice of one producer:—

"Our whole cost scheme consists in the first place, of a budget, made up the first of each year, for every department, machine and production centre. This budget must naturally be based upon past experience plus an intelligent estimate of the possibilities for the year. The hours of operation, or the production units are arrived at by taking an assumed 80% of possible operating time as a basis. In all these industries the standard week consists of forty-eight hours, or an eight-hour day. Deducting Sundays and holidays we assume that the year consists of three hundred working days of eight hours each, or 2,400 hours. We take 80% of this, or 1,920 hours, as our normal unit. This figure used in connection with our budget of expense and operation gives us our normal rate.

"We use this normal rate at all times in figuring both estimates and costs. Last year most manufacturers operated more than this normal, with a result that their actual costs were less than the normal cost, and this gain was taken as a sundry profit.

"At the present time the costs are running considerably higher than the normal, and for some time at least we must absorb this loss, maintaining at the same time a standard normal rate, but not subject to the violent fluctuations brought about by any increases or decreases in the volume of business handled."

But the number and percentage of establishments so operating is indeed inconsiderable and to many the mere idea of distributing overhead on a basis of a normal year is novel and daring.

Normal Most Satisfactory Basis

The treatment of overhead in the way indicated is not a panacea for all our industrial ills. The control of overhead in a manner fair to the business man as well as the consumer is one step and only one step toward realizing more stable prices and eliminating those wild fluctuations that culminate in industrial depressions. Such a consideration also points out this moral, —that the hope of permanent reduction of costs rests only in the greater, more continuous and more regular use and operation of our industrial facilities.

Thousands of firms went through the recent years of full-blast operation upon a basis of overhead distribution essentially unfair to them. A start in the right direction must be made, and upon such firms is urged the consideration of adjusting overhead charges on the basis of a normal year, and it is so suggested, both as an advance in sound cost accounting and as a measure to facilitate that business revival we all desire, need and anticipate.

Electricity in the Sash and Door Plant

Full Advantage of Straight-line, Mass Production—Operate Special Fabricated House Department—Specially Designed Equipment

By Geo. S. Perry
Vancouver Representative

Mass production, like cost accounting, appendicitis, and many other more or less highsounding modern expressions, is not so new as it seems. We always had these things. Mass production is nowhere so strikingly exemplified as in a modern sash and door factory, where a machine is set to cut a single piece, whether rail, or panel, or header, and it is fed with lumber of the size cut to suit, until possibly several thousand of the one piece are turned out all ready to be assembled with other parts into a door, window, or whatever standard item of stock it is intended for. One of the best places to see this carried out is in the model electrically driven plant of the Hanbury mill on False Creek, Vancouver, B.C. This sash and door factory, which is but one department of the big sawmill concern operated by the veteran western lumber manufacturer, John Hanbury, is apt to be overlooked when looking over such an extensive plant. It is, however, well worth a special visit in itself.

Straight Line Production.

To begin with, the plant is entirely operated by electricity, and practically every machine has an individual motor. There is perhaps an exception. In one part of the shop three motors drive three distinct units of the plant. These are the door machine, with chain morticer and sticker; the sash unit, with its tenon machine and sticker, and the panel raiser, goring and relishing machine, and shaper.

In the arrangement of the plant the idea has been to keep the stock moving steadily in one direction, and that the shortest, from the receiving point until the finished parts are piled in the storage racks or carried on factory trucks to the assembling machines. The general routing of the material is to the right from the moment it enters the factory at point of delivery. The lumber stock, in standard sizes, passes two cut off saws and one rip saw, sizing the stock in the rough, as to width and length. Two double-head tenoning machines take each stick and both ends are shaped at once. The stock for doors then goes to the door machine, with its chain morticer and the sticker which shapes each rail. There are many door specifications still requiring the raised panel, for certain classes of trade, and for that purpose the panel raiser and shaper is used. The assembling of the doors is done in a power door clamp, which handles all sizes of doors rapidly and efficiently.

Clean and Orderly.

The sash unit has a foot power clamp, also an arm sander for special sizes of sash. The open stock, after being put together, passes to the right to the glazing department, and thence direct to the shipping room for crating. A three drum sander is used for all stock, whether for shipment or to go into storage. Window and door frames are built on bill, and stock is carried ready for cutting. A New Britain dado machine cuts both the straight and bevel gains at the same time. A special sliding saw is used as a cut off and another small saw is rigged to make the cuts for the recess in the frame.

A visitor is at once struck by the extreme cleanliness of the plant, and the absence of all litter or dust. A very complete blower system connects with every machine, and powerful fans carry off all dust and shavings to the burners which are installed at the sawmill, at quite a distance from the sash and door plant. Power for the entire plant is generated by the steam plant of the mill, and an emergency line connected with the B. C. Electric system is also kept up. Steam coils are installed for heating the factory in winter, and the steam for these is also from the saw-mill boilers. This model electric plant has a daily capacity of approximately 100 to 125 doors, and about the same number of pairs of stock sash, depending on size and specifications. The main floor of the factory is 72 x 120 feet in area, and in addition to this, the shipping and storage floor for made up stock is about half that size.

Ready-Cut House Department.

Another interesting adjunct of the sash and door plant, which is housed in adjoining space, is a cut-to-fit house department, where all lumber is assembled and cut, bundled and marked in accordance with minute instructions from the companies specializing in these buildings. Sections of studding, shiplap, siding, etc., down to a fraction of an inch are trimmed. Every rafter is cut and notched, and in this connection a very clever rig has been devised by Mr. A. Pengelly, the superintendent of the sash and door plant. He has rigged a cut-off saw on a swinging arm, suspended from a circular overhead wooden table, which rotates on flat surfaced rollers. The motor operating the saw is also suspended from this overhead table, so that it moves freely with the saw arm. By this device any angle can be cut on a rafter, and to cup hip rafters with their compound angle, Mr. Pengelly has a special table in which he can set the rafter on the angle, as well as turning the saw to the other angle. Another table is used to raise the rafter being cut, to the centre of the saw, for cutting the notches without cutting through. The table being set at the right distance, the saw cannot reach beyond the marked depth.

Increased Efficiency on Dovetailer

One of the dovetailing machines in Showers Brothers factory at Bloomington, Ind., gave the operator considerable trouble through burned out bearings. It seems that the babbit would burn out once or twice each week. The workman decided to overcome this trouble, so they substituted bronze for the babbit. After three weeks without trouble they decided that the cure had been found.

Anather loss on this same machine occurred in the use of leather belts, which had an average life of five weeks. Pigskin belts were substituted for the leather, and after four months' use seem to be in perfect condition.

With these changes the machine's speed was increased 1,300 revolutions per minute. This resulted in an increase of several hundred drawer fronts and ends each day—a real tribute to the men who planned the changes.

Problems in Standardization of Dimension

Accuracy in Manufacture and Grading Prime Requirement—Specialize in Certain Lines—Accept Attitude of User.

By Wm. A. Babbitt, Chairman Standardization Committee.

One might easily and safely hazard the opinion that the lumberman who is not willing to take the time and trougle to get the woodusers' point of view had better stay out of the dimension program altogether. In fact, the writer believes that in no other way can a lumberman get a proper sense of the importance of small things in present day lumbering more easily and accurately than to look at his business from a woodusers' standpoint. The wooduser is daily brought face to face with these "small things" in lumber. He knows how tremendously they affect his whole production problem. These "small things" the lumberman is apt to overlook, but the wooduser cannot do so.

We will assume, for the sake of illustration, that a lumberman has gone into the production of dimension for some large manufacturer of turned wood products. This customer wants his stock sawed in steps of one-eighth of an inch, throughout a certain range of sizes. Such a specification might strike a lumberman as unreasonable, especially if his customer should refuse oversize squares. Let us say that the customer wants 1 in. by 1 in. squares, while the lumberman ony has 1⅛ in. by 1⅛ squares. Why be fussy about so small a matter as ⅛ in. oversize?

Waste More Than Seems

But the customer is not unreasonable, and he can easily show the reasonableness of his position. Did you ever figure the difference in volume between an 1 in. x 1 in. square and a square that is ⅛ in. larger? Probably not. But the manufacturer of turned wood products knows—or ought to know—that if a certain job requires five thousand feet b.m. of 1 in. x 1 in. squares, he will have to pay for 6,250 feet, providing he listens to the lumberman who wants him to buy for this job, squares only one-eighth of an inch oversize. 1,250 feet of this stock will be thrown into shavings, at an extra cost of $125.00 for material plus the cost of manufacturing that 1,300 feet of lumber into shavings plus the cost of slowed production, due to the excessive turn-off, on account of unnecessary oversize. This ⅛ in. oversize square is 25% larger than the required square. It would be very conservative to state that this ⅛ in oversize. in this case, would add at least 50% to the cost of raw material for the job. The point is that the woodusers' attitude is not always stupid or unreasonable. Sometimes there is a very valuable grain of sense and gleam of intelligence therein.

Glimpse at Other Side

The reverse side is naturally the lumbermen's side. Let us suppose the lumbermen had said to his customer: "I haven't the one-inch squares, but I will give you the inch and one-eighth at the same price, as there is very little difference." The customer accepts. How does the lumberman come out? He sells his inch and one-eighth squares at a discount of

Illustrating a lot of so-called "squares"

over 20%, assuming that he was selling both sizes on a per M base.

Further, this illustration sheds new light on the importance of proper equipment for sawing. The writer's somewhat extensive observation would tend to confirm the opinion frequently expressed that most dimension outfits are equipped with saws that produce one-inch squares from stock which with proper saws would produce inch and one-eighth squares. In which case, 200 board feet or more, are converted into sawdust, for every thousand feet of merchantable dimension stock produced, board feet which ought to be sold for real money. On an average dimension mill run of 7,500 ft. a day, some 1,500 feet of merchantable stock daily "goes up the flue." The point is that the question of saw kerf is much more important in manufacturing dimension stock than in manufacturing plank. It is as many times more important, as the average number of rippings per board. Could there be any school of economy for lumbermen, more suggestive and profitable than to operate a dimension mill with persistent and intelligent reference to saw kerf and net footage in terms of dimension stock?

The writer has ventured to extend his illustration to this great length in order to bring home the vital point that it is all important for lumbermen to see this dimension problem from the view point of their customer. Furthermore, we wish to make plain that there is no step in the dimension programme which is not characterized by similar mutual advantages.

Should Specialize in Certain Items

It would be a big undertaking for one mill to cover the standard specifications for, let us say, farm waggons. Very few mills could safely undertake to stock the line of specifications which have been submitted by the National Association of Wood Turners. Careful students see little chance for the mill who attempts to cover the whole field. It would seem to be folly for any mill to attempt to cover a tenth part of the furniture manufacturers' requirements.

So this programme of standardization evidently requires a lumberman to approach the production problem with reference to a particular field, rather than in a general way. In a word, he will be under necessity to decide, not to manufacture dimension stock; but to manufacture certain lines that careful surveys show (1) to be easily and reliably marketable; and (2) which interlock, so as to use up all stock available for dimension to the best advantage. Furthermore (3) he will install machinery with special reference to his specialized lines.

Accept Viewpoint of User

If it is safe to say that the lumberman who is unable or unwilling to approach the standardization problem from the wood user's point of view, had better stay out altogether; it is equally safe to say that he also had better stay out unless he is prepared and determined to dismiss a number of long settled and totally mistaken ideas about dimension stock. It will make all the difference in the world whether the lumberman looks down on, or looks up to this programme. We've got to respect our job.

Some of these fundamental opinions which are quite mistaken:—

1. That dimension stock is a low grade proposition. It will be essential to success to root out this idea, though frequently it will require a mental stump-puller to turn the trick. This operation would kill some of us.

But the truth is that dimension stock stands out as the sole high grade proposition. Dimension stock is lumber refined to its highest utility and greatest economy. Dimension stock is lumber with the destructive wastes eliminated. Most dimension stock grades higher than any commercial grade, especially in hardwoods. It is true that the great bulk of all dimension can be manufactured out of low grade lumber, but the dimension itself is ordinarily top grades.

2. That dimension stock is a low grade manufacturing proposition. This mistaken belief is so firmly fixed in the minds of the production staff that, in many cases, mental stump-pullers will be useless. Nothing short of a funeral, or a flock of funerals, will correct this evil. We are in possession of all the necessary data to prove that the chief reason why most attempts heretofore to salvage the obvious wastes of lumber operations by manufacturing dimension stock have failed is because the producer did not realize that the manufacture of dimension stock is a much higher and more difficult production problem than sawing logs.

Wide Variation in Sizes

In order to get this matter vividly before you, we are submitting a photograph of a lot of squares. These were manufactured by a concern that stands second to no other, as producers of accurately manufactured lumber. I know of no mill with better mechanical equipment. Yet study this picture. Can you find a single square in the lot? If you do, most likely the other end would prove to be some other shape. The writer has had most unusual opportunity to investigate this phase of the question, and he wishes the reader to understand that this picture does not represent an unusual case.

3. The third mistaken idea is that the curing of dimension stock involves the same factors and methods as curing plank lumber. In this connection, it is to be said that the Association of Wood Using Industries has secured the assignment of a specialist from the Forest Products Laboratories to give this problem the same attention that has marked their handling of the problem of kiln drying lumber.

4. The fourth mistaken idea is that the problem of properly handling and grading dimension stock is not a basic condition of success. Nor is this a simple problem. One of the main tasks in the programme of standardization is to determine how this stock can be handled economically on grades. Many a permanent customer for dimension has been killed off by receiving a car in which grades, sizes and kinds were dumped, in one chaotic jumble.

Three Indispensable Requirements

Standardized dimension stock requires the manufacturer to put new meaning into the word "accuracy." The production penalties against inaccurately sawed dimension stock are very much greater than those which apply to mis-sawn lumber. In most cases, mis-sawn dimension has little or no salvage value. Over-size, not infrequently, will be found an objection of considerable importance to the wooduser. It is always a serious loss to the producer.

Years ago, when the new standards of accuracy were coming into vogue, an old-time machinist came along and watched the writer finishing a set of drawing dies. After a while, he remarked, "I reckon that a sixteenth of an inch would make quite a difference on the fit of those dies." I reckoned so myself. Today there are not a few woodworking plants who work to limits of .001, at a fixed humidity. Relative to

general practice in manufacturing plank lumber, a corresponding increase in accuracy is called for in manufacturing dimension stock.

The second requirement is **speed.** Dimension stock must be handled fast. In some of the oldtime dimension mills, down east, which have specialized on spool bars (from which thread spools are turned) for many years, it is no uncommon case far a gang of nine men to saw and pile eight thousand feet of dimension squares per day, as an average for the season. This includes removing the edgings and waste. Experience is required to show that it is possible to produce accurately sawed dimension stock at high production

The third requirement is economy. Attention has already been directed to this point in the opening paragraphs of this article. The cost of unnecessary kerf, of careless layout of cuttings, of unnecessary oversize, of mis-sawing and of mishandling are enormously greater than corresponding faults in commercial lumber.

Furthermore, to handle dimension economically for both the producer and the consumer, it will probably be necessary to go to some expense to separate grades and lengths and sizes, and to bind these in secure separate bundles. All these precautions and careful methods cost money and must be paid for, with a reasonable profit, by the buyer. But dimension stock is worth more to the buyer than clear lumber in the plank, in nearly all classes and grades. If it is the duty and privilege of the lumber associations to educate and encourage their members to manufacture dimension stock which is as good and as standard as wheat or gold, it is equally the duty of the Associations of the Wood Using Industries to educate their members to the economic value to them of standardized dimension stock, so that their buyers will recognize and pay the higher values that lumber in this form represents, as compared with commercial lumber.

The woodusers have had the opportunity of reading this discussion from a lumberman's point of view The purpose of the next paper is to discuss the same problems from the wooduser's view point.

Apropos the Printers' Strike

UP AGAINST IT.

CAPITAL TO LABOUR. "YOU MAY SUCCEED IN KNOCKING ME OUT, BUT DON'T FORGET THAT THEN YOU'LL HAVE TO FIGHT A CHAMPION THAT NO ONE CAN STAND UP AGAINST."

—From Punch

To Trademark Walnut Line

A move in the right direction was made by the Gibbard Furniture Co., Ltd., of Napanee, Ont., when they decided to adopt a trade mark for their walnut line. The accompanying illustration shows the attractive design which has been selected. In addition to being a trade mark, this plate embodies a guarantee as to the kind of wood used.

The furniture dealers and buying public in general are looking for a high-class article, and as a rule are prepared to pay a little additional when they are assured of the quality of the piece in question. The trade-marking of a line indicates that the manufacturer believes in the quality of his product and backs that belief with his name and reputation. This cannot help but carry conviction to the ultimate buyer, and tend to allay any doubts he or she may have.

Should such a practice become general, and as the quality of a line becomes established in the minds of the public, it would not be long before people would go into a store and ask for furniture of a certain brand or manufactured by so and so. Such a tendency could not but help have a far-reaching effect on the whole industry, as it would tend to raise the quality of the product of the furniture factories, and would be a step nearer the time when the attitude of the public will be such that Canadian furniture will be made up to a standard and not down to a price.

Made-in-Winnipeg Exposition a Huge Success

Many Interesting Woodworking Exhibits—Combination Kitchen Cabinet and Buffet Featured—Other Fine Examples of Woodwork

By E. H. Chapman, of our Winnipeg Staff.

One of the most successful exhibitions ever held in Western Canada took place in the Board of Trade building, Winnipeg, from the 9th to 14th of May. It was very pleasing to see the fine exhibits made by the woodworking concerns of Winnipeg. The following exhibitors are to be congratulated upon their displays and their co-operation which helped to make the Made-in-Winnipeg Exposition the great success everyone considered it to be.

Radford-Wright-Wilson Co., Limited, featuring a combination cabinet, illustrated herewith; one side being a dining room sideboard, the other a kitchen cabinet. The cabinet fills an opening five feet wide by seven feet, two inches high. The top part is eighteen inches deep and the bottom part twenty-four inches deep. There are plain plate mirrors in the sliding doors and D.S. glass in top. The cabinet created a great deal of interest. Another part of their exhibit well worthy of mention was a very fine example of staircase work showing winding string to bottom treads which was of unusual design and workmanship, as was also the various built-in internal domestic conveniences. The Radford plant is equipped with one of the most modern lumber drying kilns in Canada; thus enabling their wood to be thoroughly dried and properly prepared before it is manufactured into the various products.

D. Ackland & Son, Limited, Winnipeg, gave a splendid display of wheelwright productions and smithy work, embracing such articles as implement shafts, double trees, single trees, neck yokes, carriage rims, wagon hitches, horse shoes, wrought iron gates and fence work, and various other articles showing expert forge work.

The Rat Portage Lumber Co., Limited, specializing in box making, of which a large variety was shown, specially designed for taking care of the transportation of all kinds of perishable products. The display also included a large variety of mouldings, particularly designed for furniture and interior house decorations.

G. W. Murray Co., Limited, showed a very attractive entrance and vestibule made to order for the 'Elite Cafe,' Regina, Sask. This was made in mahogany and was a piece of exceptionally good work, showing workmanship of a high order in the panelling and moulding of doors, walls and cealings, all being in very suitable for this particular wood.

Two new B. C. incorporations are the British Columbia Wood, Wool & Fibre Products, Limited, head office, Vancouver, B.C., capital $25,000, and The Fine Art Furniture, Limited, head office, Vancouver, capital $10,000.

Dining Room side—Sideboard

Kitchen side—Cabinet

SHOWN BY RADFORD-WRIGHT-WILSON CO., LIMITED.

Tea and Rubber Chests for Indian Trade

H. R. Poussette*

There is a large trade in wooden chests for use in shipping tea, rubber, desiccated coconut, etc., throughout the Middle East, or at least in that part of it which is under review. Although the statistics do not show the countries of origin, it seems clear from the information gained from importers that at the present time most of these chests are being brought in from Japan, under the well-known name of Momi chests.

The outside measurements of a typical box are 24 by 19 by 19 inches and ½ inch thick; its contents are 5 cubic feet and it contains from 200 to 225 pounds of rubber. The inside of the box must be planed and the ends dovetailed.

In addition to Momi chests, what are known as Venesta chests have also been imported into India, Ceylon, etc., but at the present time these are so high in price that the trade has dropped to practically nothing. Chests have been imported from Russia (or, to be more accurate, from Siberia also), but these have now been out of the market for several years. Japanese exchange is high as compared with the rupee, and it is very possible that this factor will seriously affect the imports of Momi chests from that country, and will drive the planters in India and Ceylon to make use of the local article. One Indian tea planter stated that he was able to manufacture tea chests on his own estate at 1 rupee 4 annas each, exclutive of the cost of nails; but he was in an exceptionally fortunate position as the trees grew on his own estates. He also stated that he preferred these chests, which he made out of the wood called Toon, to the imported article. Although this wood is not entirely odorless this did not appear to affect the tea. One large importer of tea chests in Colombo mentioned that he had had quotations from Vancouver, but that they were found to be just a little too high for the price ruling then, which was July of last year. The price quoted c.i.f. Colombo was 1.25 cents, which worked out taking the rate of exchange at 2.25, at Rs. 2.50 or Rs. 2/8 Indian currency, but he was of the opinion that if this quotation could be reduced to 2.61, a start might be made and at a still slightly lower price a good trade could be done. Since then the rupee has fallen, and this will have the effect of placing the c.i.f. price still higher. Now that tea and rubber are suffering acutely owing to the extreme depression of prices, planters will be compelled to use cheaper chests, and although as a rule the imported article is preferred, they will probably be reduced to using those of local manufacture. In Ceylon locally-made tea chests were selling last summer at about Rs. 2 or a little more per chest, but they were considered very inferior to either the Momi or the Venesta chest.

In Ceylon there is a demand for chests in sizes varying from 5 to 90 pounds, which is especially large for the smallest size. Chests suitable for tea can also be used for packing rubber, desiccated coconut, etc.

The wood used in tea chests must be of a particular kind. It must contain no sap which has the effect of corroding the lead, and must be entirely odorless, as otherwise tea, which has the tendency to absorb odors, would become impregnated, and therefore seriously suffer in value. It is also necessary that the wood should be thoroughly seasoned, otherwise it is likely to warp when packed with the warm tea, which is packed in this condition so as to ensure its absolute dryness, then enclosed in lead and hermetically sealed, for dryness is absolutely essential.

India is said to possess plenty of suitable wood for tea chests, but up to the present the local chest does not seem to have been able to compete successfully with the imported article, or only in abnormal times such as the present. The future may remedy this state of affairs, and India become self-contained in the matter of tea and rubber chests. A large firm of managing agents have erected a three-ply factory in Assam for the manufacture of tea chests, but it remains to be seen whether they will be able to hold their own against the imported product, should exchange rise to its par value, which is two shillings.

*Director, Commercial Intelligence Service

New Field for Wood Boxes

Among the practices of antiquity we must class the molding of cheeses in the shape of chariot wheels. Perhaps the ancients rolled their cheeses down the mountain sides to market. The making of cheese is an art bound by traditions almost sacred. Cheeses have been round because they were always round.

Some time ago we printed a little article, "Why Is a Cheese Round?" which attracted some attention. The only reason we have yet discovered is one probably first used by Mother Eve and still used by her daughters to this day to account for things mere men do not understand:—"Because."

A progressive cheese factory at Appleton, Wis., is producing a cream cheese of rectangular section, made into a convenient brick weighing five pounds. A slice of this cheese is just right for a sandwich. Four of these cheeses are shipped in a nice square wooden box. They are easy to handle, and there is no waste. The popularity of this method of packing has been so great that many other Wisconsin factories are shipping their big round 100-lb. cheeses to this factory to be cut up and molded into the new form. All is in such demand that it is sold before it is packed.

For six months the company has been able to fill only forty per cent. of its orders. As the United States produces some 420,000,000 pounds of cheese annually, this new form of cheese may be expected to provide a new market for some millions of good wood boxes.

As in the case of the apple-box vs. the barrel, the new idea is a great success, and the new form of package is likely to soon rule the market.

B. C. Church Moved Fifteen Miles

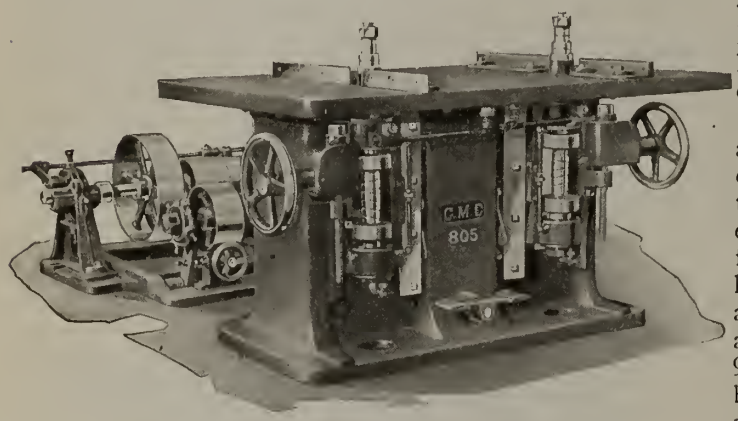
After an eventful journey, which has occupied over two months, which included "rolling" on land for three miles, navigation on scows down the Fraser River for 12 miles, then another 3 miles of jolting land transportation before finally reaching its destination, a Baptist Church has been moved from Coquitlam, B. C., to Kerrisdale, B. C.

The church was built at Coquitlam in the boom days and was intended to serve the spiritual needs of a population that never came. The Baptist Board finally solved the problem of this empty church by deciding that it should be taken where there was a congregation waiting for it, on the outskirts of Vancouver.

Machinery & Equipment

High Speed, Double Ball Bearing Shaper

The Canada Machinery Corporation, Limited, Galt, Ontario, has recently brought out a double spindle, high speed, ball bearing shaper. It is in principle much the same as the single spindle shaper placed on the market about a year ago, which met with such general approval that they decided to offer a double spindle machine of the same type. The frame, as will be seen from the illustration, is a single cored casting with broad flared base. The table is a thick, reinforced plate which eliminates all danger from vibration and concentric rings are fitted in the table so that openings of varying sizes may be made around the spindles to allow the use of large cutters. The spindles run in anti-friction, dust proof ball bearings



New C. M. C. ball-bearing shaper.

which are mounted in rigid housings. Removable collars are placed around each spindle to allow the use of different sized cutters. The spindle oiling device is new and each spindle is oiled from its own sight feed oil cup placed under the table for protection. A finished circular plate is fitted in the table directly over the oil cups and can be removed for filling or adjusting the cups. The oil feeds down through pipes over the upper ball races to a reservoir in the top bearing from the top of which it overflows and feeds to the lower bearing, and after lubricating the lower race and step ball, it fills the lower reservoir and overflows from the top of the lower reservoir to drip pan, from which it may be emptied so that oil does not get on the floor of the factory. The spindle arbors are as near solid blocks as possible. They are scraped true on the bearing surfaces and bedded in places between deep V gibs on the frame. They are vertically adjustable by handwheels. The belts are shifted by a convenient treadle belt shifter on the front of the machine. The countershaft furnished with each machine is equipped with an adjustable belt tightener which adjusts in any direction to direct the course of the belt as well as take up the slack and the pulleys may be changed to run the spindles in either direction. Spindles are equipped to run at 8,000 R.P.M.

Cut-off Saw Table

A new swing cut-off saw table has been designed and placed upon the market by the Oliver Machinery Co., Grand Rapids, Mich. The many interesting features of this table make a very practical installation. It is 16 feet long, 19 1-2 inches wide, and 30 inches high, being designed for use with the overhead swing cut-off saws.

The top is made of kiln dried rock maple, with angle iron girths and one piece cast iron legs of rigid design. The table is composed of two parts or sections. On the rear of the right hand section is mounted the scale rail, which is graduated in eighth inches from 0″ to 96″, plainly marked and accurate. On the left hand section is mounted the Oliver No. 419 patent automatic swing cutoff saw gauge, which comprises a square rod graduated on eighth inches from 0″ to 96″ plainly marked and accurate. Four automatic malleable iron stops, one centre and two end rod holders are mounted in place. This automatic saw gauge is a time saver where any number of parts are to be cut off to the same length. After the gauge is once set it is thereafter unnecessary to measure any board which is to be cut off to the length designated by the stop. Rollers are inserted in both sections of the table in every other opening the full length of the table. A dust chute is fasetned between the two sections of the table, having 6″ diameter pipe opening for connecting to exhaust system. These are the seven principal features which we give for this saw bench:—1st, most complete swing cut off saw table now made; 2nd, Has automatic stop rod; 3rd, has dust chute attached; 4th, will not warp; has angle iron girths; 5th, rigid iron leg construction; 6th, scale board has renewable scale for wear; 7th, can be used in connection with any overhead swing cut off saw.

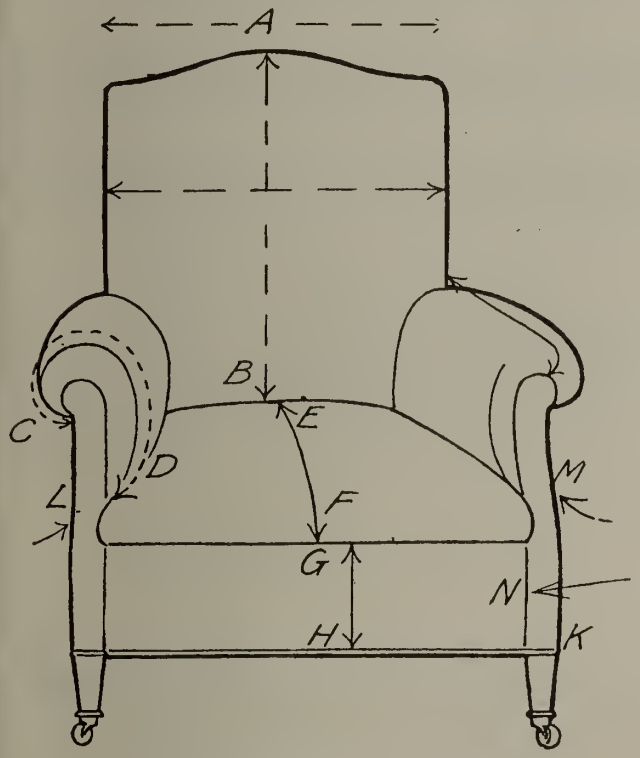
Efficient cut-off saw table.

Upholstering and Trimming

Planning and Cutting Coverings

Much Material Wasted Through Careless Cutting —Mistakes aud Waste Take Heavy Toll Careful Planning Required

The 4 in. and 6 in. mentioned above at D and E between the seat and upper parts of a stuffover chair, while sufficient for such an example as that shown, must not be taken as the general rule, but a safe plan to eliminate the danger of faulty extensions is to allow as much as possible at these parts. By careful planning the upholsterer should be able to see exactly how much material he has at his disposal over and above the net measurements, but to plan carelessly



Chair No. 302, showing pieces of covering required

or make first cuts because the quantity of material allowed appears ample is to court failure. The beginner must leave nothing to chance, and it is only by practice that he will be able to form a correct judgment of the number of inches to allow beyond the net measurements. A simple method of planning the covering for the chair (Fig. 302) is shown at Fig. 303. A to B represents a 2¾ yard length of a double-width material, the vertical line, A—B, indicating the centre fold. The width being 50 in., the measurements are calculated by 25 in. This method of cutting cannot be applied to all covering materials. For instance, with a centre pattern, it would be necessary, after obtaining the measurement of the pieces required, to mark each cut with chalk or pins and place in position on the work. It will then be seen if the various pieces are planned to the best advantage and any alterations marked before cutting. Extensions would now be added to the various pieces to bring them to the required sizes, taking care that such extensions will not be visible in the completed job. There are several ways in which the material can be planned, but the one shown is simple and should not present much difficulty to a beginner.

There is no definite system of measurement when calculating the quantity of covering material needed for upholstery, and it is only by practice that the upholsterer may become competent. Absolute accuracy is, of course, the ideal thing, but as this only comes with experience, it is better when calculating to allow a little more than a little less than is necessary, because an insufficiency entails a number of complications and difficulties in making ends meet. To calculate the quantity of material needed for a chair when it is in the first stuffed stage is more difficult than one which is second stuffed in an underlining; this is because of the extra over and above the net measurement which must be allowed for.

The following points should be remembered when measuring a first stuffed chair: (a) Correct calculations cannot be made without a knowledge of the width of the material to be used. (b) Double width materials are best calculated by the 1-2 width. (c) Visualise the proportions of the work; this is helpful in making a decision. (d) The quantities should be checked either mentally, or, preferably, in writing. (e) Extension pieces serve their purposes as straining pieces; they are useless as a remedy for a tight cover.

When making calculations first allow not less than 4 in. in a small easy chair or 6 in. in a large one for the material hidden below the junction of seat and back, then judge the amount of the proportion of the first stuffing. As a general rule, the larger the work, the greater the quantity of material required from the sight line. Study the appearance of the front of the work—more liberty may be taken as regards seams, pattern, etc., with outsides. When making up the total be sure that the balance of material, if any, is sufficient for the smaller pieces required, such as facings, arm extensions, etc. Tight covers usually mean tight corners, faulty extensions, unnecessary straining of the material, a multiplicity of seams, and finally —complaints. Careful, correct measurements mean good work, and save both time and temper when covering. When in doubt as to a measurement, the beginner should err by allowing too much rather than too little material.

Below is set out the method of calculation with a tape measure from a first stuffed chair. The additional number of inches required over the net measurement is governed by the proportion of the first stuffing.

(1)—At D, B or E insert the tape 4 in. beyond the sight line.

(2)—If the hand be placed beneath the measure at the top of arm and back and at the front of seat by raising the hand slightly above the re-

ZAPONITE is a wood lacquer

It is clearly transparent and is easily applied. ¶It dries in an hour and gives a beautiful, smooth, hard coat. ¶It is absolutely dampproof and a positive protection against cracking, checking, stretching, swelling, warping and expansion of parts. ¶For more than thirty years, we have made Lacquers and offer Zaponite as an "economy-through-greater-production" finish.

ZAPON

LACQUERS and ENAMELS

The Zapon Service Man will bring finishing experience right to your work-room and aid you in producing better merchandise and in obtaining greater production at lower costs.

Put your finishing problems up to us

CELLULOID ZAPON COMPANY
200 Fifth Ave., New York
Chicago, New Haven, Los Angeles, Philadelphia

quired proportion a good idea of the gross measurement is obtained.

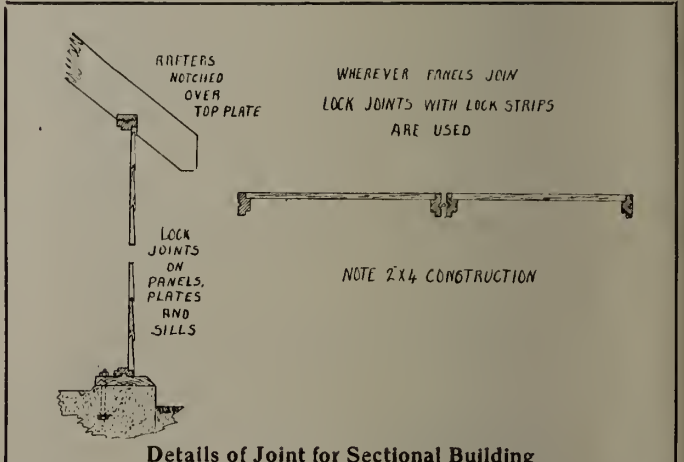
(3)—When noting the various calculations the different cuts should be indicated, viz.: I. A., inside arm; S., seat; O. A., outside arm; O. B., outside back; F., facing; B. O. R., borders, and so on.

(4)—Having cut the material for the various parts, the top edge should be indicated with chald in order to avoid the patterns being placed upside down.

In calcultaing, the inches should be reduced to yards, any balance of inches being increased to a simple fractional part rather than decreased. For example: 2 yds. 7 in. 2 1-4 ydas.; 3 yds. 1 in. 3 1-3 yds.; 3 yds. 20 in. 3 5-8 yds.; 4 yds. 21 in. 4 2-3 yds. A beginner should note any faults in calculation which become apparent when covering, comparing his estimate with the results in practice. He will in this way gain confidence, and his notes will be of value in the event of repetition work.

Joint for Portable Building

The retail lumber dealers of the United States are soon to be in a position to render a real service to their customers by carrying a line of portable or sectional garages, which are being placed on the market by the Togan-Stiles, Grand Rapids, Mich., manufacturers of Togan garages. Under present-day methods, a man considering erecting a garage, goes to the lumber dealer, and, instead of being supplied with definite information as to the probable cost of the garage, he is given a list of stock with prices, and then referred to a contractor or a carpenter for additional information. On the other hand were the retail lumbermen to have sectional garages in stock, they would be able to furnish their customer with a definite statement as to what the garage would cost when completed.



Details of Joint for Sectional Building

The Togan garage, which is being marketed through the lumbermen in the States, is noteworthy in that the designs are extremely attractive, in reality above the ordinary in this respect; also that the Togan lock-joint, used in the construction of these buildings, is unique and efficient. The accompanying sketches give a fair idea of the type of joint used. Such construction would make a solid, warm, substantial building and does away with the necessity of using unsightly batons on the outside to cover the joints formed by the meeting of the sections. Can you use the idea?

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OF EVERY DESCRIPTION

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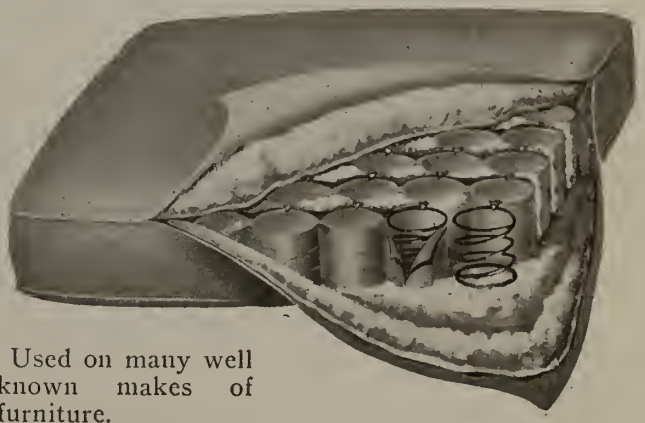
"COMFY" CUSHION COMPANY

Our Trade Mark

Famous "Comfy" Cushions

This is the much talked of cushion, that gives furniture the real touch of luxurious comfort.



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What's Wrong with Our Finishers?

Is It lack of Skill or Laxness in work? Writer Complains about Quality of Present-Day Finishes

By R. H. Stee e

It is often remarked that the little things, the trifling details that almost pass unnoticed, are the ones that count and that if due attention were to be given to these seemingly unimportant features, the larger points would take care of themselves. This applies with particular force to finishing and finishing methods, as carried on by the manufacturers of wood products, chiefly furniture and musical instruments, for it is the little details which sometimes escape attention that make or mar an otherwise valuable piece of furniture.

This fact was forcibly impressed on my mind today when admiring some fine furniture on display in the window of a well-known furniture dealer. Several of the larger and most expensive pieces were depreciated by unsightly blemishes on their finished surfaces. The first thought was why did not the gentlemen responsible for the window select a perfect piece or suite for display purposes, or, at least, place each article in such a position that the blemishes would pass unnoticed. Upon second thought I decided that this was not just the fair or honorable thing to do, and that the blame lay not with the retailer, but with the manufacturer. To carry the investigation a little further, I purposely viewed the window displays made by several other dealers, and in almost every instance the finish of the pieces shown was open to criticism. This naturally brings up the query, "Is it possible, or even difficult, to impart a perfect tone and finish to an article of wood?"

Requires Careful Attention.

Were the above question to be put to almost any man in the finishing departments of our plants, the answer would be, "No. It is quite easy to impart a good finish, but it requires careful attention to detail." The crux of the problem is in the latter thought.

"It requires careful attention to detail." That opinion bears out the conclusion arrived at when examining the furniture on display in the store window. In one instance the blemish was a light streak in the panel of a buffet door that had been touched up with too dark a stain, leaving a dark brush mark down the centre of the panel. Another was a spot on a carved ornament that had been missed. In a third place the wax or pumice had not been cleaned out of the members of the mouldings and ornaments, showing up white in the crevices. In another a hole had been filled with a substance that was lighter than the finish of the article, naturally drawing attention to the blemish that it was supposed to hide. If continued, the list would include poor toning and shading, poor varnishing and numerous other undesirable features.

Perhaps I am too critical and inclined to pick fault rather than overlook some trifling details while admiring the beauty of the piece and the general result secured. Again the strong, clear light of the large windows might emphasize and exaggerate blemishes that would not be noticeable under ordinary conditions. That is not the point, however. If furniture can readily be given a satisfactory finish without any noticeable increase in cost, then such defects, even though they are inconspicuous and unimportant, should not be permitted to pass inspection.

The buying public is not only demanding low values at the present moment, but is insisting upon high quality. In other words, it is striving to make its dollars do double duty. That being the case, it is more important than ever that "attention to detail" be made the motto of every finishing room. Again when there is a growing tendency on the part of furniture makers to trade mark or otherwise identify their product. It would be extremely foolish for a manufacturer to permit his name or trade mark to be connected with an article that is not up to the mark in every respect.

Must Produce Satisfactory Article.

The furniture industry is endeavoring to advertise the value of better furnished homes, and the lasting satisfaction that goes with the possession of fine furniture. There can be but little satisfaction unless the article is perfect in every detail. Blemishes and faults seem to grow and become magnified with daily association, with the result that some little marks that were probably overlooked when the furniture was purchased assume undue proportions as time rolls by. I know for I have a walnut buffet that was not finished as it should have been. It is putting it mild to say that I am not satisfied. When I replace it, as I intend to do, I will make sure that the new piece is not the product of the same maker.

The furniture manufacturers should give greater attention to the finishing of their product, for, after all, it is the finish that counts most. The experts in the finishing department should be trained to strive for perfections and should not be satisfied with anything less. The foreman finisher or some specially appointed inspector should examine every piece before it leaves this department, and should be shouldered with full responsibility for the reputation of the whole line as far as the quality of the finish goes.

The Vogue of Painted Furniture

There seems to be a revival to-day of the ancient art of painting furniture, but the makers are going carefully and slowly. The students of art and furniture say that this is only a "feeler" anticipating the day when truly beautiful painted furniture will be as much a part of the home as the stately mahogany and walnut "solids" of to-day.

As proof, they cite the fact that the furniture sections of museums are full of the painted furniture relics of former centuries, and are prized as the rarest of artistic contributions to civilization.

It has been proved that the frieze around the Par-

thenon at Athens was originally in colors, although carved in marble. Ancient China gave wonderful lacquers which were borrowed by Chippendale for his precious cabinets and desks.

There is nothing in the Metropolitan Museum of New York valued more highly than a pair of antique Persian doors painted in rare colors and designs that have been an inspiration to thousands of designers. These colors and patterns have been applied to modern-day rugs and textiles in great profusion.

The peasantry of the Tyrol, Norway and Switzerland has left a rich heritage of painted furniture. The ancient carved furniture and woodwork of the Gothic era was originally picked out in colors. The Georgian era of Sheraton, Chippendale and Heppelwhite also had the Brothers Adams, who did not scorn the making of painted furniture. That is why no one can be accused of "poor taste" by selecting some of the best of today's painted furniture, however inadequate the supply is.

In placing a line of painted furniture on the market, the manufacturer should keep a pattern of all styles and designs used, so that a piece can be readily replaced or matched. Another suggestion is that all coats from the primer on, should be the same shade as the finishing coat.

Why Not Bamboo Furniture?

The supply of wood for furniture making is not near exhaustion yet, but some interest is attached to the suggestion of the Times, a newspaper of Indianapolis, Ind., as follows:

"The time has passed when the only use for bamboo wood is to constitute a cheap fishing rod. The scarcity of timber, added to the rapid growth of bamboo, places that wood among the commodities destined to push to the front.

"There is no use worrying what the future generation will do for fuel when the coal is gone, nor for timber when the forests are exhausted, for ample provisions will be made in due season. Given the necessity, the human mind will solve the problem with perhaps better results than ever heretofore achieved. So many instances exist that it is almost folly to call them to mind.

"If the bamboo is not as long lived as the hardy lumber from slow growing forests, at least it may be replaced while waiting the maturity of our own trees. An oak or hickory piece of furniture, made from local wood, requires one or two generations for growth, while the year may see the bamboo planted, harvested, fabricated and in use in the home."

Qualifications of a Manager

The temper of a manager is one of the biggest assets or liabilities that any concern can have. It might be alright for some supernumerary to lose his head once in a while, even though that is not desirable, but the director of any organization must be able to control his temper. This does not mean that he must never get angry, but that he must never show it in any way.

A manager of any organization who gets into a rut or who does not attend to anything but his office duties, should be excused from his position, by his board of directors, as soon as convenient. Just about half the work that a manager undertakes should be at his office or for his company directly. Any manager who does not take an interest in civic and national affairs, should not be retained in the position he holds. In appointing a new head, he should be asked before his appointment is confirmed, whether or not his qualifications are such that he is equipped to work in a general field shoulder to shoulder with the big men of other organizations. The boards of trade, the Rotary and Kiwanis clubs or other similar organizations offer fertile fields in which a man can show his ability.

Expert Quantity Surveyors

Special organizations devoted to taking off quantities from architects' plans and specifications are springing up in different centres in the United States. These organizations or bureaus, as they are called, secure the co-operation of a number of woodworking plants who agree to pay a certain percentage of the cost of the work secured for the service rendered. This service consists in taking off from architects' plans all the details pertaining to both outside and inside millwork and furnishing typewritten copies of the same to the subscribers. Doors and sash are included, and in the case of out of town jobs, the details of the stairs. The correctness of these figures are guaranteed.

The idea is a good one. Suppose a bureau had twenty subscribers. Formerly each of these plants had one or more men whose time was taken up with taking off quantities. Naturally the same plans would be figured on by a number of concerns, which would result in an expensive duplication of effort, and in addition mistakes and guessing were bound to creep in. With the bureau, half a dozen expert listers can do the work which formerly occupied the time of from twenty to thirty men.

Newer Uses For Sawdust

Until quite recent times sawdust was regarded in wood mills as a waste product. Now it serves many purposes and has a commercial value that appears to be on the increase.

Sawdust is particularly useful in the manufacture of various building materials. Mixed with clay it makes splendid tiles and bricks, while combined with concrete an economical and good-wearing flooring material is obtained.

To French chemists belongs the discovery of sawdust dyes. They found that a combination of various chemicals acting upon sawdust produced a substance which is said to be quite as effective as the best aniline dyes for coloring purposes.

In Germany during the war a huge amount of sawdust was used for making bread. It was first treated with chemical agents to extract certain harmful ingredients, after which it was mixed with flour and baked in the usual manner.

Probably the most remarkable discovery of all is that a gas, excellent both for lighting and heating purposes, can be made from sawdust. From experiments that have been conducted, it is believed that, particularly in the neighborhood of sawmills, the gas could be produced so cheaply as to be supplied for a few cents per thousand feet.

Will *you* try this test?

This is an easy, practical test of La Tuque Turpentine, made from Canadian wood, by a patented process. Dip a piece of pure white paper into La Tuque Turpentine to about one-half its length, place in a warm spot to dry. In a few minutes when the turpentine will have evaporated completely, compare the portion dipped with the remainder of the sheet. It will be clean and unstained, with no trace of grease of any kind.

LAST year Canada imported over one million gallons—three hundred carloads—of turpentine from the States.

Importations have averaged that amount for the past five years.

And for the three hundred carloads imported in 1920, Canadian manufacturers paid an average price of $1.57 per gallon in American money—over one and one-half million dollars—in the States *before shipment*, to which should be added the cost of freight, and cartage.

This year it isn't necessary to buy the imported product, however, unless one wishes to pay the higher price, as an equally efficient Canadian-made product is now available, which not only does the same work and does it as well, but costs less per gallon.

Used as a thinner for wood thinners or enamels, for oil or japan colors, or for reducing oil stains, you will be satisfied with the result, for it evaporates smoothly and evenly and has particularly good penetrating power.

In addition, La Tuque Turpentine has one other advantage—*uniformity*. Due to a carefully standardized technical control of the output at our mills at La Tuque, P. Q., moisture and free rosin are eliminated, ensuring uniformity of every gallon that leaves the plant. Can uniformity be claimed for all of the turpentine you have purchased in the past?

Nearly as colorless as water

Compare a test tube of La Tuque Turpentine with pure water. They look very much alike, for the turpentine is nearly as colorless as water.

If you would like further specific information regarding the application of La Tuque Turpentine to your particular needs, or desire a liberal working sample for testing purposes, we shall be glad to hear from you

BROWN CORPORATION

Mills at La Tuque, P. Q.

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La Tuque Turpentine®

PAINT THE INTERIOR OF YOUR FACTORY in the same modern, improved and speedier way that the manufactured product is finished.

While clean, light reflecting walls insure increased efficiency and improved production, the use of

Aeron Finishing System
Surpasses Brushing

Portable Painting Equipment

insures more thorough, longer wearing and cleaner painting at a lower cost,

The average speed of Aeron spray-painting is 5 times that of the brush method. Any kind of paint can be applied on any kind of surface, outside as well as inside.

Let us mail you the complete facts.

The DeVilbiss Mfg. Co.

3718 Detroit Ave. Toledo, Ohio, U.S.A.

Particulars about AERON SYSTEM EQUIPMENT for the finishing room will also be sent if desired.

Linseed Oil has its best equivalent in "FLAXICON." Either in boiled or raw, is elastic, durable and waterproof. Working to the best advantage with colors ground in oil.

Penfound Varnish Co.

CARIBOO AVE. - TORONTO

"ENAMELS"

Our business in both White and Old Ivory Enamels and Primers has trebled during the past year.

WHY?

They are the best on the market. If you are not using them, write for samples and prices.

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Ault & Wiborg Co. of Canada, Ltd.

Varnish Works

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Cut Down Your Refinishing Expense

Revarnishing is an expensive, slow and unsatisfactory way to handle marred, scratched or damaged furniture. It takes days for drying and rubbing and requires an excessive amount of material and labor.

Refinishing is absolutely unnecessary. There is a way to avoid the grief, delay and expense resulting from injury to the varnish.

FREE BOOKLET

Ask for our Free Booklet, "How to Repair Damage to Varnished Surfaces." It will explain how to avoid revarnishing, how to fix any injury to any kind of finish quickly, easily and without waiting for varnish to dry. WRITE TODAY.

If you are too busy to write a letter pin this ad to your card or letterhead.

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FINISHING PRODUCTS

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WOOD STAINS

Soluble in

WATER, SPIRIT, TURPS, &c.

Highest Concentration
Complete Solubility
Best Value

In Imitation of All Natural Woods

We are Especially Strong in

BLACKS

and can Meet any Competition

Williams Bros. & Co.

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ZERO

Natural West Va. Rubbing Oil

BEST Because that beautiful shining surface becomes almost impervious to finger prints

CHEAPEST Because it goes further on the job than Parafine Oil

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The Best Products

Mr. Furniture Man, some of the best factories find this to be so. Try for yourself.

Zero Oil Company

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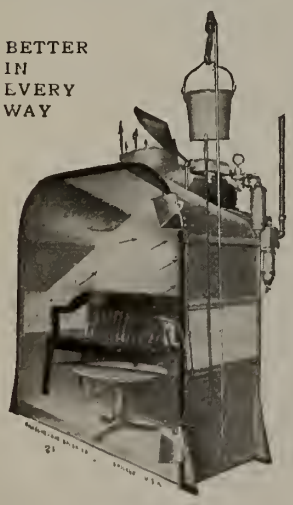
BETTER FINISHES — LOWER COST — INCREASED PRODUCTION

These are the findings of manufacturers who dispensed with old time hand brush methods. Regardless of your product you will find

BETTER IN EVERY WAY



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In hundreds of leading furniture woodworking, piano cabinet plants Paasche Equipment is more than "making good" every work day in the year.

Most efficient and economical air finishing system known. One of our many popular (completely equipped) air finishing outfits as used by furniture plants everywhere. Made in various sizes to meet all needs. Applies liquid materials —all kinds.

Paasche Superior Finishing Equipments

Better—Quicker—Cheaper Way to Finish

How many pieces can you finish by hand per week? Multiply by 5 to 8 and you'll get an idea of the importance and value of Paasche equipment to you.

You cannot figure Paasche equipment as an expense—It is AN ASSET and A NECESSITY.

Investigate:—It will pay big returns on the investment.

Intelligent service rendered with each installation.

Write us to-day.

This Most Efficient Air Rubbing Device

It Means Better—Smoother—Quicker and Cheaper Work. Eliminate the Hard Fatiguing, Hand Rubbing Method and operate your Finishing Department on a Strictly Efficiency Basis.

RUBS AS EFFICIENTLY AT 4 P.M. AS AT 8 A.M.
Girls Can Operate Them

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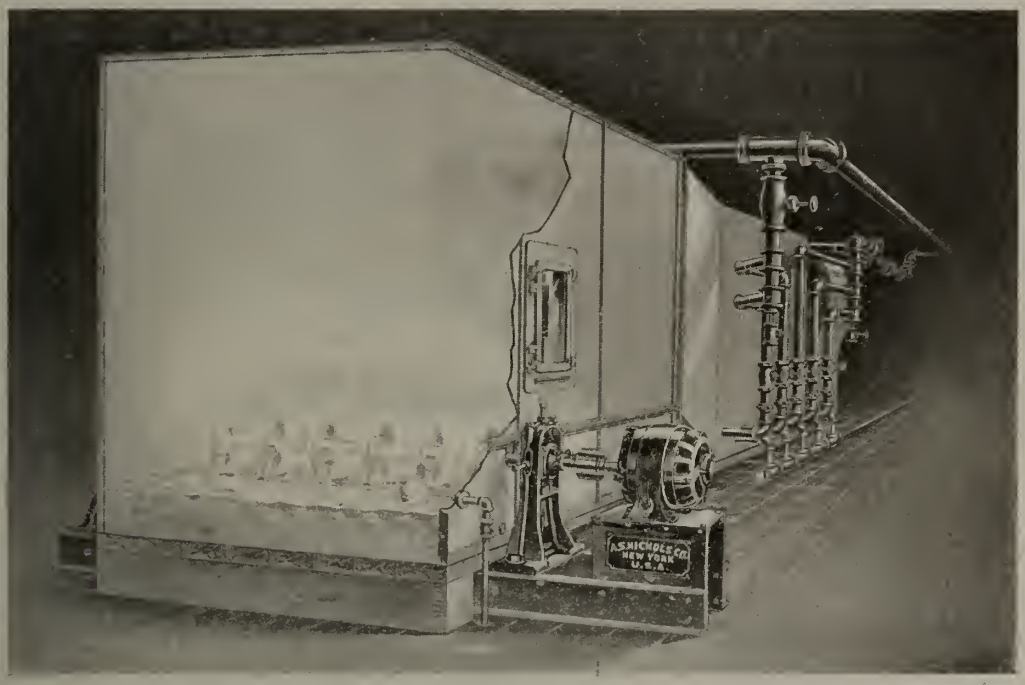
Paasche Portable Painting Outfits are extensively used for Painting Interiors and Exteriors. Ontario Rep.: R. S. Pollard, Preston, Ont.

The Nichols' Varnish and Paint Dryer

A complete unit of fan, motor, heaters, air compressor, with automatic humidity and temperature controls.

A new rotary humidifying air washer, which eliminates all dust and dirt, does away with all spray heads, pump and connecting piping.

Manufactured in sizes suitable for all requirements.



DO YOU KNOW:

That the finest pianos, talking machine cabinets, furniture, and automobiles are finished by this method?

That the finish can be dried cleaner, faster and better in this way than by any other method? That the work is more durable and stands up better?

That all varnish shrinkage takes place in the DRYING ROOM, coat by coat, during the drying period, and not days or months later in show room or home?

That on cold mornings the finishing room can be quickly warmed, increasing comfort of men, coating efficiency, and condition of varnish?

That the finishing room can be properly ventilated and the health, working conditions and comfort of the workmen much improved?

That these results are obtained the year round, in Summer and Winter(irrespective of outside weather conditions?

That the investment pays for itself in one year or less?

These are FACTS and guaranteed by the A. S. Nichols Company, Sole Agents for all territory East of the Ohio, Mississippi and Detroit Rivers, in the United States and Canada. We are prepared to answer questions and quote prices on any drying problem. Communications covering varnish drying propositions west of the above mentioned territory, should be addressed to the Drying Systems Incorporated, Chicago, Ill.

We also continue to manufacture the Nichols' lumber and veneer dryers that we have been making for over thirty years.

A. S. NICHOLS COMPANY

Aeolian Hall, 33 West 42nd St.. NEW YORK, N. Y.

Buy and Build for the Future

The woodworking industry to-day is hungry for quality service. The manufacturer possessed of vision, builds for the future, and ensures his business by a consistent supply of high grade veneers.

There is beauty and permanence in our

Rotary Cut Veneers, Birds Eye Maple, Plain Birch and Maple Veneers

The present prices—the quality of our product—the prompt efficient service, these are good reasons why you should buy now.

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BeVeCo VENEERS

Veneers and Panels

Faith, Confidence — More Confidence

J. T. Horne, President Veneer & Panel Manufacturer's Association, Delivers Inspiring Address on Present Conditions.

It has now been six months since we met here as a body of representative veneer and plywood manufacturers, and during that time our souls have been sorely tried by the depressed business situation, as it is to-day, and as it has been during the past six months. In the language of the philosopher, Abe. Martin, "We're meddlin' in European affairs, the price of utilities is goin' up, the income tax burden is to be lifted from the shoulders of the rich and spread around, the mail is late every other day, the sawmill is closed down, soda water is still fifteen cents, and we're gettin' back to normal fast, we don't think." We have had, during the past year, profiteering and extravagance, high prices, high wages; we now have falling prices and a buyers' strike which is still on in full blast. We now have low production, shut-downs and unemployment. We have had railroad congestion. We now have idle cars. We have had big inventories and big losses, big crops and shrinking values; we have had and still have a very serious housing shortage with high rents and dissatisfied tenants. We have had large bank deposits; we now have declining bank deposits, with a big demand for loans. The tax man is after us with a big stick, and some of us, we are sure, will be compelled to borrow money with which to meet our income and excess profits tax of 1920. And who is to blame for all this?

Placing the Blame.

As a general proposition, when things go wrong, our natural inclination is to look for some one who has been at fault and upon whom we can place the responsibility. For our present unfortunate business depression, everybody is inclined to blame everybody else, but without reason. The truth is that no one in particular is to blame. Parallel conditions exist in all countries. We and all the so-called civilized world have been and are now in the grip of economic forces too strong for any class, any monetary power or any government to avoid. The expansion of credit, the high prices for labor and for goods, the fictitious prosperity and the resulting industrial crash were the inevitable and unavoidable aftermath of the costliest war in all history. They are all explainable by and attributable to the workings of the law of supply and demand.

In our particular business, veneer and plywood, and it is no exception to the general rule, the demand for our product during the past six months has been at the lowest point in the lifetime of the men who are here to-day, and allow me to say here that during a period of twenty-nine years in which we have been actively engaged in the manufacture of some product from timber, that the past nine months is the only time in the twenty-nine years of our experience that we have been unable to sell our product at some price, and I am quite sure that there are men here to-day representing other mills who have found the same condition to contend with that we have. The principal reason why there has been no greater demand for our product is for the reason that during the time when our product was scarce and prices abnormally high, the buyers of our stock seemingly bought everything in sight, regardless of price, and piled their warehouses to the top with this high priced material, and when the slump in prices came—as we all knew it would come—they were unable to dispose of their finished product at a price based upon the cost of the raw material that would let them out without an enormous loss, consequently their warehouses are still stocked with high priced veneer and panel, and being unable to realize a profit based on the cost of their material, many of them are closed down.

Prices Not Controlling Factor.

I feel very sure that some of us, during the past few months, have quoted prices far below the cost of production in an effort to dispose of our output, and keep our plants in operation, and have met with but little better success than those of us who asked a fair price for our product, as in either case but a very small percent of our normal production has been sold.

The law of supply and demand is as old as civilization itself, and it always has, does now and will continue to rule so long as man inhabits the earth. But even with this gloomy outlook of the past, I do not believe that we should be discouraged or disheartened. We certainly believe in ourselves and in our country, and are all proud of it. We are just as certain to have good business in the future as we have had in the past, and there is no question that that we can work out our business problems, and as stated, finally come back to a prosperous time. But it will take to do this, first, intelligence, and this we manufacturers all have, of course. And we must use this intelligence in an intelligent way and not expect values to come back to wartime prices in a day's time. It will take our concentrated effort; it will take all the patience that we can use, and time. How much I will not venture to say. But above all, it will take faith—faith first, in a Supreme Ruler—faith in our glorious country—faith in ourselves—and last, but not least, faith in our fellow man—faith to believe in him—faith to believe, not in the golden rule, but to believe the golden rule, and to believe that it is applicable to the every day life of the business world; that it was made for you and me, and when we and the balance of the business men of this continent come to see the value of the golden rule, and are willing to apply it to themselves and do for their customer and for the man with whom they deal as they expect their customer and man with whom they deal to do by them, then the day will soon come when we can rest assured that when we have sold one or mor cars of our

Continued on Page 110

Plant of the Penrod Walnut & Veneer Company, Kansas City, Mo.

The Manufacture of Walnut Veneer

Walnut Coming into Its Own—Excellent Material for Furniture and Interior Woodwork—Interesting Phases of Its Manufacture

No home should be without it's black walnut furnishings, for black walnut is particularly attractive, and is considered by many to be the peer of hardwoods for furniture construction and for interior trim. Surely, there are but few hardwoods that can compete with the inherent dignity of walnut, its exquisite markings, and oftimes bizarre yet symmetrical figuring secured from the gnarled burls peculiar to American walnut. Truly this strictly American forest product is deserving the eulogy of the poet for in this hardy wood nature has secreted many wonderful treasures of beauty.

There has in the past been little attempt to generalize the use of walnut in spite of the fact that it was highly prized by every housewife who could boast of walnut furnishings. It seems that woodworkers in European and other foreign countries were first to fully appreciate the value of walnut, and they could not comprehend why North American manufacturers and woodworkers neglected to utilize this wonderful wood with its fine grain, its natural beauty and adaptability to the best work of the skilled carver and woodworker. And so walnut logs were conveyed across the Atlantic for European artisans, while our own artisans, blind to its virtues, were importing extraneous woods to adorn our homes. Then, too, it seems that manufacturers on this continent were the victims of a propaganda to the effect that walnut was scarce and hard to secure, and that they could not depend upon a continuous supply in the event they specialized in or produced a line of furniture in American walnut. In many of our high grade furniture houses, little or no attempt was made to sell merchandise of walnut; rather the buyer was led to feel that other woods were preferable and good dollars were invested in woods of foreign origin.

Continuous Supply Available.

However, it has been demonstrated during the past three or four years that walnut is not a rare wood on the verge of extinction, but, instead, we have learned that the supply is sufficient to meet any domestic demand for years to come, for furniture, interior trim and other commercial usages.

One of the leading organizations dealing exclusively in walnut lumber and veneer, is the Penrod Walnut & Veneer Company of Kansas City, Mo., of which J. N. Penrod is president, R. L. Jurden, vice-president, and J. C. Rodahaffer, secretary and treasurer. The company was organized in 1896 by J. N. Penrod and Judge S. F. Prouty, the latter retiring from the business in 1914. Mr. Penrod has been connected with the walnut business practically all his life, and got his early training in the trade in Indiana, where he bought and sold logs. He also was connected with the firm of John H. Lesh & Co., as buyer and salesman for many years prior to establishing the Penrod Walnut & Veneer Co. Mr. Jurden, who is also president for the Penrod Jurden Co., Inc., Memphis, and one of the most progressive factors in the hardwood industry, opened his lumber career in 1904 with the Penrod Walnut & Veneer Co. He is a thoroughly experienced operator in all departments of lumbering. Mr. Jurden succeeded Alexander Lendrum as secretary and general manager of the Penrod Walnut & Veneer Co., in 1913, and became vice-president in 1917. Mr. Rodahaffer was previously connected with Geo. W. Hartzell of Piqua, Ohio, first as yardman and in the later years a member of the sales department. He was also on the sales force of T. B. Stone Lumber Co., for four years, and in 1908 returned to the Hartzell Company as sales manager.

Have Large Output.

In total the members of this firm are experienced and practical walnut men. Their superintendent of veneer operations, J. S. Stone, who, incidentally, is a stockholder and director in the company, is recognized as being the best authority in the country on walnut veneers. Mr. Stone has had long experience in the veneer business, both as a manufacturer and consumer. He had charge of designing and construction of the Penrod Veneer Plant, which is located on the Kansas City Terminal Railroad, with direct connection with the principal trunk lines reaching Kansas City.

The daily cut of the sawmill is 15,000 feet of logs, and of the veneer mill 4,000 feet of logs. The latter is equipped with two Capital veneer lathes, one 124 inch

Continued on Page 110

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, CINCINNATI, OHIO.

Mahogany and Walnut Veneers

Veneer department at New Orleans, La., showing 10-ft. Rotary and Clipper and 16-ft. Slicer in rear.

Chicago Offices — M. S. Johnson, 39 W. Adams St.
Toronto — J. R. Kennedy, 50 Front St., E.
Grand Rapids — Geo. A. Baker, Hotel Cody.

THE FREIBERG MAHOGANY CO.

Offices and Warehouses:
CINCINNATI - OHIO

Saw and Veneer Mills:
NEW ORLEANS - LA.

Mahogany Importers and Manufacturers

NATIONAL VENEER & LUMBER CO.

AMERICAN WALNUT VENEER
Long Wood and Butts

QUARTERED WHITE OAK VENEER
Sawed and Sliced

1635 West Michigan Street - INDIANAPOLIS, INDIANA

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SAVE FREIGHT

Rotary Cut Birch and Gum

Why pay freight on gum veneers from southern points when our cutting mill is so near the border.

PANELS

We manufacture Tops, Fronts and Panels of all kinds

Ask for our "Ready to Ship" Stock List

MOHAWK VENEER CO., INC.

Warren, Pa.

Plywood Dept. Warren, Pa.

Cutting Mill Salisbury Center, N.Y.

Litton Veneer Co.

Manufacturers

American Walnut, Figured Gum, Sliced Quartered Oak, and all Kinds of Figured Woods

Walnut and Quartered Oak Lumber

Office and Mill

ROCKFORD - ILLINOIS

J. W. Frye Lumber and Veneer Co.

Dayton - Ohio

Manufacturers and Wholesalers

Specialize in

Walnut Lumber and Veneers

Oak Lumber and Veneers

Also All Native Hardwoods

Guarantee all stocks to be Ohio and Indiana grown

"——— still cutting Northern grown Oak"

Reg. U.S. HB *Pat. off.*

EST. 1867
INC. 1904

A FLEET of trucks similar to this, are constantly kept on the go in our logging operations. This will give you an idea of the quantity of northern grown oak, walnut, and other timber handled by this company.

It has taken many years to grow the confidence we enjoy. Like our sturdy product, confidence is a plant of slow growth—but it lives long and is worth cultivating.

We specialize in northern grown oak, American walnut and hardwoods. Veneer sawed and band sawed, and rotary cut poplar at our Burnside, Kentucky, mill.

Will you not give us an opportunity to demonstrate our ability to serve you?

HOFFMAN BROS. COMPANY

FORT WAYNE - INDIANA

Established 1867 **Incorporated 1904**

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Western Office, 516 Lumber Exchange, MINNEAPOLIS, MINN. Mills at GLADSTONE, MICHIGAN

The Northwestern Cooperage & Lumber Co., Gladstone, Mich.

THE HOME OF "PEERLESS" STANDARD BRAND PRODUCTS

Manufacturers of

"PEERLESS" ROTARY CUT VENEERS

in Birch, Elm, Basswood, Maple, Ash and Beech for all purposes

Also hoops, liners and staves for manufacture of packages

Also "Peerless" Rock Maple, Beech and Birch flooring; Hemlock lumber; Lath, etc.
"Peerless" products are standard everywhere and you are always exercising Safety First in using them. Try us next time.
(When writing mention Canadian Woodworker)

IN OUR CHICAGO WAREHOUSE

We have the most complete assortment of the choicest figured woods of all kinds, suitable for the manufacture of any kind of furniture or interior finish.

Samples on display in our warehouse here, or sent on approval.

These woods cannot be equalled for quality, figure or price. Let us know about your requirements.

We allow 2% for cash on regular terms and make no charge for drayage.

Our Prices are Fair. ***Our Service Unequalled***

VENEER MANUFACTURERS COMPANY

Phone Blvd. 5240 **1036 W. 37th Street, Chicago, U.S.A.**

100% EXCELLENCE

Manufacturing
High Grade ROTARY CUT VENEERS
Specializing BIRCH DOOR STOCK,
MAPLE PIANO PIN BLOCK STOCK

Years of Experience Behind Our Products

The Munising Woodenware Co.

MUNISING, MICH.

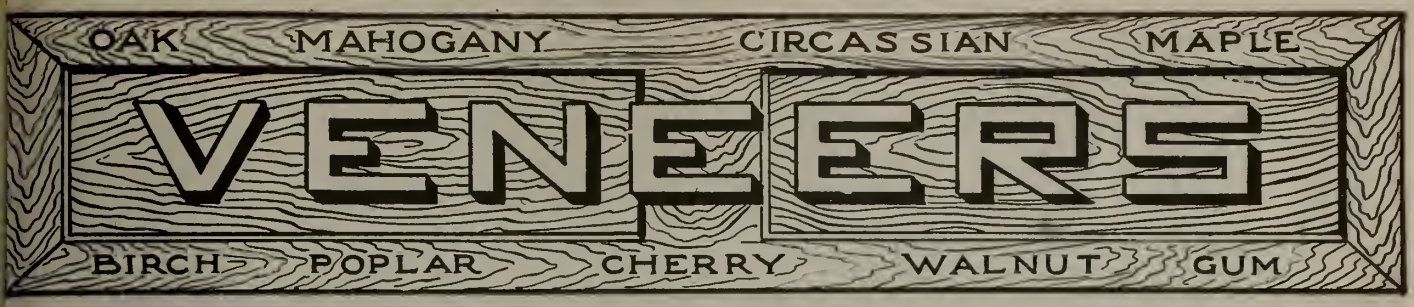
WE HAVE A COMPLETE STOCK OF 3 and 5 PLY PANELS IN VARIOUS WOODS AND THICKNESSES FOR QUICK SHIPMENT

Also offer 3/8" 3 ply Fir s-2-s Panels for Drawer Bottoms and Backing.
1/8" Rotary Cut Northern Red Oak
1/8" Rotary Cut Northern White Oak.
1/8" Birch Veneer 6 to 36" wide 60 to 86" long.
Panels also made to your dimensions.

Write for Prices

GEO. L. WAETJEN & CO.

Milwaukee - Wisconsin



Poplar and Walnut Veneers

We specialize in large size poplar veneers as we have extra fine poplar logs. We can cut veneer up to 10 feet square.

Our walnut veneer cannot be beat, both in plain and figured wood.

Write us for prices.

Central Veneer Company
Winter Ave. and Belt R. R., INDIANAPOLIS, IND.

Sovemanco

Southern Veneer Manufacturing Co., Inc.
LOUISVILLE, KY.

Importers and Manufacturers of all kinds of Sawed, Sliced and Rotary-cut

VENEERS

CARRYING

a large stock of selected Mahogany, Figured and Plain Walnut, Walnut Butts, Sawed and Sliced Quartered Oak and Sycamore and all other native woods.

1,000,000 Feet
QUARTERED RED GUM
to select from

WE Respectfully solicit your inquiries

Buyers of Veneers and Panels

will find it to their advantage to purchase from the manufacturers and dealers whose advertisements appear in this publication. They are progressive firms—the leaders in the business, which is a guarantee of good service and prompt attention to orders.

Give your business to the man who will spend his time and money to get in touch with you. He deserves it—if his stock and prices are right.

Wide Veneer

One carload of 1/20″
Quartered White Oak
Sawed Veneer
12″ and wider

Ready for Quick Shipment.

Memphis Veneer & Lumber Co.
MEMPHIS, TENN.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Guelph Patent Cask Co., Ltd.

Scotstown, Que.

QUALITY *SERVICE*

Canadian Veneers and Plywood

For Canadian Customers

Rotary Cut Textile Dried

We specialize in 3/16" and ¼," 3 ply Drawer Bottom and Panel Stock—cut to exact size

QUALITY *SERVICE*

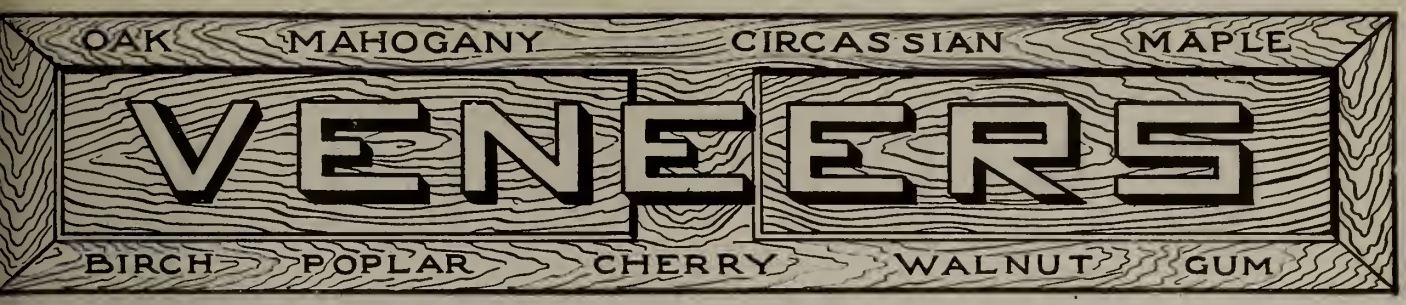
PICKREL VENEER COMPANY, Inc.

MANUFACTURERS OF

American Walnut

Exclusively

Woodruff and River *New Albany, Ind.*



INVESTIGATE

P.-J. SERVICE

For high-grade rotary cut veneer, that is smooth and evenly cut and dried by mechanical means to any percentage of moisture desired.

We also operate large band mills where all kinds of southern hardwood lumber is cut from our own tract of timber in the very heart of the Saint Francis Basin District, Arkansas.

PENROD-JURDEN COMPANY

A Name that Should be on your Enquiry List for both Veneer and Lumber

Mills at Helena and Penjur, Ark. General Offices: Memphis, Tennessee.

Penrod Walnut and Veneer Co.

KANSAS CITY, MO.

Exclusive Manufacturers American Walnut Lumber and Veneers

AMERICAN BLACK WALNUT LUMBER

FAS—6-9¾" Wide, 8-16" Long

3/8"	3,750	Feet
1/2"	21,470	"
5/8"	44,140	"
3/4"	25,962	"
4/4"	82,502	"
5/4"	26,766	"
6/4"	39,201	"
8/4"	33,140	"
10/4"	14,245	"
12/4"	11,470	"
16/4"	3,700	"

FAS—10" and Up Wide, 8-16" Long

1/2"	9,680	Feet
5/8"	18,980	"
3/4"	14,430	"
4/4"	48,872	"
5/4"	14,165	"
6/4"	10,262	"
8/4"	16,920	"
10/4"	10,250	"
12/4"	1,800	"
16/4"	2,100	"

Fas—6" and Up Wide, 6-7 Feet Long

3/8"	1,200	Feet
1/2"	5,790	"
5/8"	840	"
3/4"	8,940	"
4/4"	32,400	"
5/4"	2,300	"
6/4"	7,800	"
8/4"	1,500	"
10/4"	1,400	"
12/4"	500	"
16/4"	400	"

SELECTS

4/4"	32,940	Feet
5/4"	27,530	"
6/4"	21,480	"
8/4"	33,590	"
10/4"	16,850	"
12/4"	6,054	"
16/4"	1,332	"

NO. 1 COMMON

3/8"	8,000	Feet
1/2"	27,380	"
5/8"	29,850	"
3/4"	31,285	"
4/4"	59,675	"
5/4"	38,240	"
6/4"	18,750	"
8/4"	39,240	"
10/4"	16,363	"
12/4"	4,768	"
16/4"	1,604	"

NO. 2 COMMON

3/8"	1,500	Feet
1/2"	1,900	"
5/8"	4,500	"
3/4"	2,190	"
4/4"	72,250	"
5/4"	47,890	"
6/4"	31,720	"
8/4"	35,940	"
10/4"	19,140	"
12/4"	20,116	"
16/4"	16,088	"

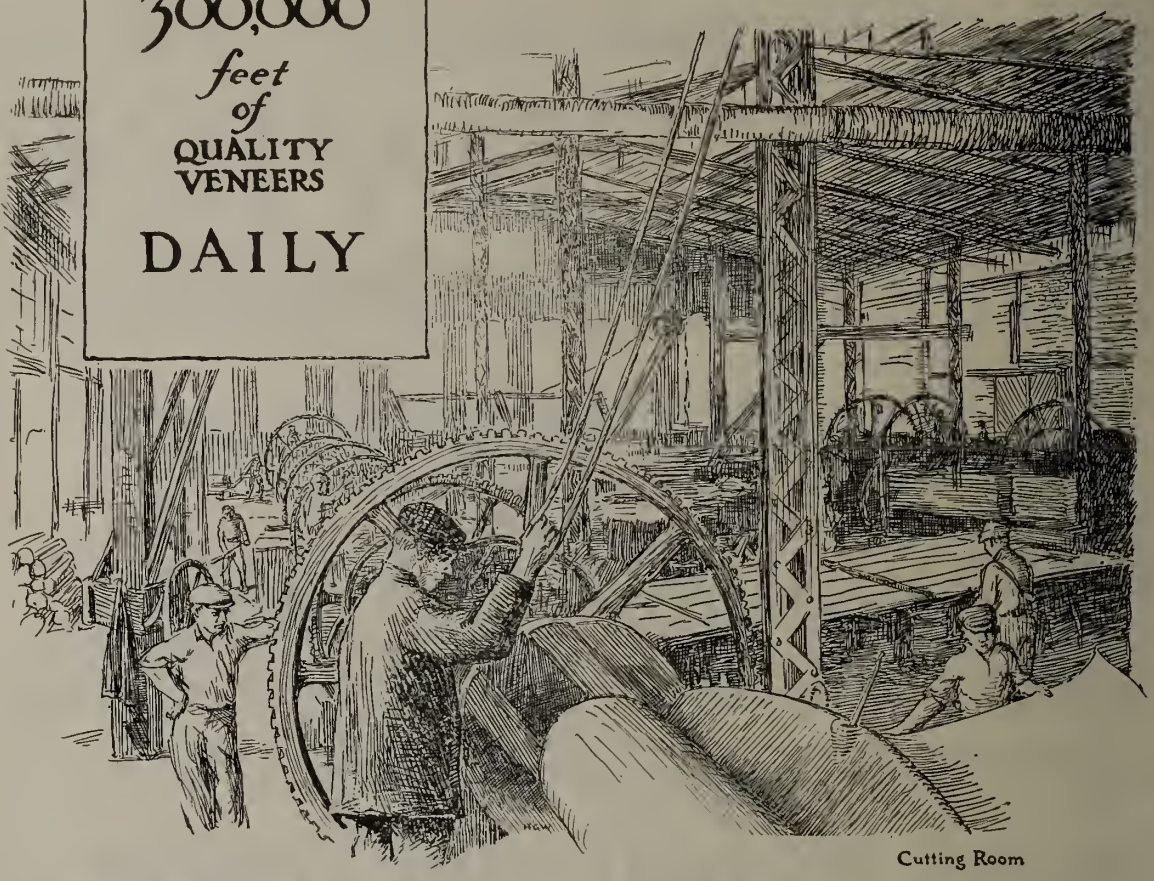
Write for prices on any items you are interested in *"PENROD SERVICE" Satisfies*

C. A. Rugg, 115 Foots Avenue, Jamestown, N. Y., Eastern Representative.

Geo. C. Hall, 610 South Michigan St., Representative for Chicago and Michigan territory.

CAPACITY

300,000 *feet* of QUALITY VENEERS DAILY



Cutting Room

"RIGHT VENEERS AT RIGHT PRICES"

in

WALNUT BUTTS ✻ MAHOGANY
LONG WALNUT · BURLS · OAK · POPLAR ETC.

MILLS - BALTIMORE, MD.,

BRANCH OFFICES and SAMPLE-ROOMS:

709 SIXTH AVENUE NEW YORK ✻ HIGH POINT ✻ JAMESTOWN ✻ 28 E. JACKSON BLVD CHICAGO

THE WILLIAMSON VENEER CO

Evansville

Sliced
Walnut

Indiana

Sawn and Sliced
Quartered Oak

Veneer

Sliced Figured Gum
Rotary White Oak
Rotary Cut Gum
Faces, Backs
Drawer - Bottoms
Cross Banding
Center Stock

THE Evansville Veneer Co.
MANUFACTURERS OF
VENEERS.
EVANSVILLE, IND

Perfect Drying ~ Always

Correct drying is the most exacting science in woodworking. It is consistently accomplished in Wood-Mosaic plants through the employment of recognized experts and exacting care in selecting kiln operators. So perfect has the Wood-Mosaic system become that it is able to furnish veneers guaranteed to specific moisture content and lumber dried correctly for the purpose intended. Our veneer and lumber driers have all been selected after long experience and painstaking investigation. They are so constructed and arranged as to be adaptable specifically to the different requirements of any kind or thickness of stock. Their operation has been scientifically checked by laboratory experts and found correct. Four Texile dryers do the work in the veneer plants—twenty-one modern kilns in the lumber plants.

Wood-Mosaic hardwood lumber and veneers in walnut, oak and poplar are always in demand because of selected timber, splendid manufacture and always perfect drying.

WOOD-MOSAIC COMPANY

Incorporated
Louisville, Kentucky

Chicago Representative
GEO. W. STONEMAN & CO.
845 Erie St.

Grand Rapids Representative
HECTOR ROBERTSON
232 Lyon St., N.W.

ALGOMA *the Better* Plywood

Admiration!

Admiration for his finished job inspires your workman to better craftmanship.

Admiration for what you have to sell attracts the ready customer.

You can encourage admiration by the kind of plywood you use. Better matching of the grain—better surfacing—better gluing—better seasoning—more accurate cutting to each dimension—these are qualities of plywood which determine the quality and selling power of your product. For that reason, Algoma, the better Plywood deserves your consideration. Made in all sizes and shapes to fit your requirements. Investigate the economy of our stock-sized panels, which save on the cost through standardized manufacture. Let us give you estimates.

ALGOMA PANEL COMPANY, *Algoma, Wis.*

Views Snapped in and Around the Penrod Plant

1. Rotary saw for breaking-out logs. 2. Lathe used for producing rotary-cut stock. 3. Preparing logs for boiling and cutting.
4. Veneers in warehouse awaiting shipment. 5. Clayton A. Rugg, the Canadian salesman, inspecting large walnut burl.

VENEERS

The Quality Kind

We carry in stock, for immediate shipment, 3 and 5 ply Panels in Birch, Oak, and Mahogany — sizes 24" and 30" wide, 48", 60" and 72" long.

A complete range of American Walnut, Quartered Oak, Mahogany, Figured Gum Veneers and Rotary Cut Veneers.

It is not uncommon that a really fine piece of furniture has been practically ruined after a few months service because of the poor grade of veneer used. Such happenings do much to harm the manufacturer's reputation. That is why many will not consider anything but the best—usually they insist on Toronto Veneers—the quality kind.

Toronto Veneer Co., Ltd.

1100-1104 Queen St. West, TORONTO, ONT

Walnut, Quartered White Oak and Mahogany Veneers and Lumber

Prompt Delivery

LONG-KNIGHT LUMBER COMPANY

INDIANAPOLIS, IND.

knife with 72 inch swing, and one 10 2inch knife, cutting about 75,000 to 100,000 feet of veneer daily. Three large warehouses hold about 10,000,000 feet of veneers, and a stock of walnut lumber approximating 3,000,000 feet is maintained in the lumber yard. Logs are shipped to Penrod, of Kansas City, from practically every source where there is sufficient to make a carload, but the principal supply is obtained from Illinois, Missouri, Iowa and Kansas.

Ideal for Interior Trim.

The great volume of the company's business goes principally to the furniture and panel trade. but it also specialises in interior finish, one of its latest contracts covering the interior trim of the new $200,000 home of the Hereford Cattle Breeders' Association, Kansas City; also the Linwood Boulevard M. E. Church, the largest church in Kansas City, which required about 40,000 feet of walnut lumber and 8,000 feet of veneer, the big structure being finished throughout in walnut.

Until a few years ago the walnut lumber business was largely export, Mr. Penrod personally making frequent trips to Europe to look after foreign trade. However, during the past four years the company has devoted their entire time and energy to the manufacture of veneers and lumber for the domestic trade, giving special attention to the needs of the furniture manufacturer in the United States and Canada. The company also puts special emphasis and gives special attention to the builders of good homes, office buildings and all public buildings, such as churches, theatres, etc., as there is no wood to equal walnut for interior trim when it comes to real beauty and service combined.

Penrod service is a trade axiom, which those who have tested this service readily appreciate. This service does not merely mean prompt shipment made possible by warehouse and yard stocks, coupled with excellent transportation service, but it also signifies an understanding of walnut lumber and veneer utilization by men who have "been through the mill," or conversely, a practical comprehension of trade requirements.

Faith, Confidence — More Confidence

Continued from page 95

product, that the buyer will take it as he agreed to take it, and also be assured of receiving just exactly what he bought.

Employer Must Do His Part.

From our viewpoint, we believe that labor to-day is far more efficient than it was six months ago, and we believe it will continue to be more efficient as time goes on. There are entirely too many idle men in this country, and so long as our food products are sufficient to feed, not only our own people, but many of the starving millions of the earth, there is no reason why the man who labors with his hands in this country should not receive just compensation for his time and labor, and no reason why he should not give an honest day's work for the pay which he receives.

I fear sometimes we are inclined to want to unload too much of our burdens upon the men who labor for and with us in our factories. We should use every economy in every department of our plants; use some economy in our own expense account, and if necessary draw less salary so that we may be able to reduce the cost of production to a point at which it will sell based on the earning capacity of the laboring man and the farmer. The farmer, as we all know, has been very hard hit; his products were the first to come down, but they are going bravely on, and he who works either with his hands or on the farm should be assisted by us manufacturers in every way that is possible, for they are our best customers. It has been said, and no doubt truly said, that the farmers and the laboring men of the country, and they are our freest spenders, spend annually more than all the balance of our population.

You hear it said almost every day that if railroad rates were reduced it would help business. I hope this is true, and no doubt rates will be reduced in the very near future, and they should be, and while the reduction of freight rates and passenger fares would be a great help, it is not the big thing in our minds, but the biggest cause of all as to why we are in our present condition that can be remedied is the financial situation in Europe. We all know very well that we have enermous food products in this country, and an enormous lot of manufactured products of all kinds, raw material with which to make more, and still there is no demand with which to make more, and still there is no demand from abroad, and there can not be a demand until these people are financed and put in position where they can take our surplus output. We have almost one-half of all the gold in the world, and as has been said by one of our leading financiers, there is such a thing as having too much money. It is not so much that we want their gold, but we want them to buy our products, and they can only buy them as we are willing to take their products from them, and I am sure right here is where I will get into trouble with some of you men when I state that I do not believe the United States needs to put a prohibitive tariff on the products of the Old World, and while it might help us as manufacturers of our products to have a tariff on lumber, I am not in favor of it, for the reason that we need now in America millions of new homes. Rents are abnormally high, as I have already stated, and they will not be reduced until houses are built to house the families of this country.

And finally, let me say this in closing—that if we leave this meeting with our minds fully made up, each of us, that we are going back home and do our very best to give employment to every man that we possibly can; that we are going to co-opertae with every other industry in so far as we are able; that we are going to apply the golden rule to business; that we are going to play the game square—by the time we meet here in Chicago in December, I am sure that many of the dark clouds that now hover over will have rolled away, and we will all return here with a more optimistic feeling than we have to-day.

The Manufacture of Walnut Veneer

Continued from Page 96

Market for Plywood

A South Africa firm are desirous of getting in touch with Canadian manufacturers and exporters of plywood. Samples and prices are requested, also shipping details for clear pine and pine shelving. Inquiry 2811.

A very faint straw color denotes a very hard steel, pale straw less hard, dark yellow a good working temper for large outlined cutters, a deep orange to purple a temper suitable for cutters with small details upon them.

The smaller the moulding, the harder the task of making it.

LELAND G. BANNING

CINCINNATI, OHIO

Our Specialty:

SOFT OAK PLAIN AND QUARTERED

also **MOUNTAIN POPLAR**
WALNUT, ASH, CHESTNUT
OTHER HARDWOODS

Canadian Representative:
A. E. KLIPPERT,
11 LAXTON AVE.,
TORONTO, ONT.

BAND MILL:
FRANKFORT, KY.

1897 1853 1921

Veneered Panels

Ready for quick shipment in following veneers

Walnut, Plain Oak, Birch, Quartered Oak, Mahogany, and Maple.

3 Ply—1/4" thick and 5 Ply—3/8" thick.
Sizes—72 x 24, 60 x 30, 60 x 24, 56 x 25, 60 x 20, 60 x 18, 48 x 18.
also in quantities cut to size for
PHONOGRAPH CABINETS, FURNITURE DRAWER BOTTOMS, ETC.

Hay & Co., Ltd.

Woodstock, Ontario

Why is Business at a Standstill?

A Contractor's Viewpoint on Existing Economic Conditions and his Suggestions for a Return to Normal

By "Logus"

The real reason that business is practically at a standstill is because all things cost too much to produce. They cost more than they are worth. The worth of a product is what someone else will pay for it. At present, possible purchasers will not pay the present costs of production in any volume greater than absolute necessity, because in the great periphery of business all cannot afford to pay the costs of production. So at various points on the cycle of business, the line is broken and the procedure stops. The cost of a product is the combined compensation of all labor used and paid for in that product. Whether Carl Marx, or Henry George, or Laughlin, Perry, or Cobden, there is no disagreement on this, and the only disagreement is the relative value of capital, promotion and sale together with the great and most costly element: labor. No fair critic can deny the equitable value of each element nor can he conclude that in the evolution of business one element can maintain a high relative standard while one or more other elements are fixed at a lower value. Ultimately and naturally they must be uniform.

Why is there no sale of products now at present prices if wages are still high, while a year ago, with prices a little higher there was a good market? Because a year ago there was employment and to-day there is the least for many years. If no money comes in none can go out except small sums of any surplus there may have been from previous employment. Where has the money gone that dropped like rain for a few years? Mainly, it was used to pay individual and corporate debts and finally lodged in the hands of those individuals or institutions that had originally loaned the sums. It has also shifted not alone from individuals and corporations, but from nations, and now lies idle because no means can be found to start it again in circulation.

Was there an increase of the intrinsic value of wages or values of commodities in the proportions of the increase in denominational lines? By no means, no. Why? Because had the intrinsic increase been the same as the denominational, all surplus would have increased in similar value, and if $2,000 was the income and cost of maintenance of a person, family, or commodity for a definite term or thing, and the intrinsic value including increase had been made $3,000, there would have been an unused surplus of $1,000, but the intrinsic value was the same, but the denominational value enhanced $1,000. By the denominational value is meant thta value stated in terms of dollars or pounds, or any other value based on the value of any unit or sub-division of a unit fixed by weight in gold. All realize this is standardized, but not so the service necessary to make an equitable exchange. This is variable, and as during the war, gold was needed to make international exchange balances in greater quantity than there was gold at the sources of purchasers, creating adverse balances, and it rose to a premium, and as this value is fixed, the premium operates in inverse ratio upon commodities and labor. Hence more service had to be given to conclude transactions, and to induce the provisions needed, they not only maintained the previous prices and rates, but increased same to overcome the depreciation in the relative value of the service. This method to the unthinking might appear possible, but it was gold that was needed in the exchange more than service, because the first is transferable from country to country, but not the latter, and instead of moving ahead in this Micawbian method of finance, the difficulties were increasing and the movement was backward in place of forward.

What happens under such circumstances as regards money? It is plain that if eight million people daily, or weekly, or monthly require 211 million dollars to complete these transactions in 1914, and they double the denominational value of the same business in 1920, they will require 422 million dollars to do the same business. But the intrinsic value of the dollar would be the same. All the people had worked all the time, and all the products were worth the whole of all the service and to double the value of the goods in price did not give anyone a cent in gold value more than the whole. This has actually happened.

On March 31, 1914, Canada had $141,823,281 in gold and $211,144,102 in note circulation, and on March 31, 1920, she had $190,777,106 in gold, and $440,002,420 in note circulation. This inflation in currency is reflected in the increase in price of commodities and as commodity is probably 90 percent, labor in the ultimate service was paid for in legal tender, but not in gold equivalent. On March 31, 1914, gold represented 67 percent of the note circulation, and wages, we will allow, were standard at 100 percent. On March 31, 1920, gold represented 43 percent of the note circulation, so then to provide 100 percent as represented in inflated price and currency, note circulation was increased 64 1-2 percent to make a denominational equivalent and the intrinsic value was the same.

From the foregoing it appears that, taking wages of say 50 cents per hour in 1914, by the increase in circulation 82 1-4 cents per hour in 1920 represented the same pay as did 50 cents in 1914, and the proportion holds at every wage. All know what happens when one makes notes more than he has money to pay with when they become due; and all must realize that governments and banking institutions are subject to the same unyielding rules. These notes must be retired. We cannot continue issuing notes, and we must return to a position where notes and gold are much nearer a parity. This can only be accomplished by producing at less costs than present denominational values impose, and as labor is about 90 percent of cost of production, labor must constantly contribute its proportion to its reduction. Such reduction is not a sacrifice of any part of the intrinsic value of the wage, but only its proportion of the value of the retrenchments of inflation.

It is useless and idle to argue with those who cannot see, and worse to take time with those too perverse to admit when they do see. It is not a time to "coddle" and invent other worse expedients than those

Canadian Hardwoods

Good Stocks
Right Grades
Prompt Shipments

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Crating
of all descriptions

C. A. Spencer, Limited
Merchants and Manufacturers
McGILL BUILDING - MONTREAL

THE
GALL LUMBER CO.
Limited

Established 1875

HARDWOOD LUMBER

MAHOGANY, WALNUT

Office, Yards and
Service Dry Kilns
Foot of Spadina Avenue
TORONTO, CANADA

We are carrying a large and well selected stock of

Dry Canadian Hardwoods

consisting of

4/4" & 6/4" Brown Ash
4/4" & 8/4" White Ash
4/4", 5/4" & 6/4" Basswood
4/4", 6/4", 8/4" & 12/4" Birch
4/4", 8/4" & 12/4" Hard Maple
4/4", 8/4" & 12/4" Oak
4/4", 8/4" & 12/4" Soft Elm

May we have the pleasure of quoting on your requirements?

Canadian General Lumber Company, Limited
712 Bank of Hamilton Bldg.
TORONTO
MONTREAL OFFICE: 203 McGill Bldg.

Selling
Graves, Bigwood & Co.'s
Lumber, Lath and Box Shooks

already existing, but all should "look the trouble right in the eye," and make up our minds that we must regulate our affairs in keeping with, we may say, universal conditions. We were just as well off when 10 hours' work bought a barrel of flour at $5.00 as we were when it took 10 hours' pay to buy a similar barrel at $10.00, and to-day the great majority of men in the class of work which we are considering would be far better off if they had any work at all at any reasonable wage. But a prophecy that wages will continue to drop and likewise commodities until they are, say, 35 to 40 percent less than 1920 will be borne out by the experience of those who will see the next five years. Some may think the writer has a chronic antipathy against labor, but such is not the case, as were they to make any sacrifice or concede any reduction not participated in by all through the whole line of production, he would oppose it as useless and unfair. But the conditions are universal and the remedy must likewise be universal, and there will be no difference in the whole relations. If they will see the affair as it exists, they will urge and advocate these changes now and from time to time until a normal condition is established again. And we believe they will see it and help materially in obtaining it.

CUTLER APPOINTS CANADIAN REPRESENTATIVE.

R. C. Dunbar has been appointed Canadian representative for the Cutler Lumber Drying Kiln and the Cutler Varnish Drying Kiln, as manufactured by the Dry Kiln Department of the Cutler Desk Co., Buffalo, N.Y. For the present he will make his headquarters at 885 Shaw St., Toronto.

Mr. Dunbar, who is a Canadian by birth, has had many years of practical dry kiln experience, and brings a vast fund of practical knowledge to bear on his new position. Previous to representing the Cutler Kiln in the Chicago and Middle West field, where he succeeded in making many satisfactory installations, he supervised the drying of lumber for airplane propellers for the U. S. Government, being assistant to James E. Imrie, a well known expert, who was in charge of the Wood Products Department, and who is at the present time consulting engineer for the Cutler Kiln Co. Among other duties Mr. Dunbar supervised the seasoning of the stock and the manufacturing of propellers in about twelve large plants in Grand Rapids, Milwaukee, Kansas City and Chicago, and was always in close touch with the practical side of the work. His knowledge and experience are at the service of any woodworker desirous of improving his lumber and varnish-drying and lumber-handling methods.

Group or Individual Drive

There is considerable discussion, both in the electrical industry, and also in the woodworking industry, as to the advantage of individual drive, group drive and drive of whole plant by a large motor, replacing the engine or former driving unit. We believe the decision of matters of this nature is far better made in consideration of the individual problem presented by each individual plant, rather than to attempt to make general broad recommendations. In favor of the small motor drive, is the advantage that a machine not being used can have its motor cut of, but it is open to question as to whether economy of cutting down the load by some small motors being cut out, is offset by the fact that these small motors are lower in efficiency than a motor of larger size. There are some machines used very infrequently or in a location where individual drive may be a great convenience, but the large majority of our plants are getting very satisfactory results by driving a group of machines which are conveniently located and most of which are operated at the same time in the work being handled by one motor. A practical combination of group drive and individual drive based on local conditions, is about the best general recommendation, and it is very seldom that the driving of a large plant by one motor is advisable.

Are Five Plys Necessary ?

The question as to whether or not it is advisable to lay five-ply panels in one operation is receiving a considerable amount of attention. In this connection the advantages or disadvantages of four and five-ply panels might be included. If four-ply were used, and such construction has been advocated in preference to the so-called balanced or five-ply construction, they would, probably, be laid up at one time. The suggestion has been made that a well-made three-ply core, in which the outside layers or crossbanding are together equal to half the thickness of the core, is sufficiently stiff and stable to carry a thin face veneer without the necessity of compensating any strain or pull by applying a ply of the same relative strength on the reverse side. Some interesting experiments could be carried out in view, and if the results warranted the elimination of the fifth ply, a considerable saving in first cost would be effected. Send along your views as to the practicability of four-ply construction.

Securing New Business

One hears a lot about high construction costs holding up building. One woodworker recently made the statement that low prices never made one sale of building material. The basic idea behind the sale is a desire for the article purchased and that desire can be created and strengthened by advertising.

There is a whole lot in this idea. If a strong enough desire for a home be aroused, price or construction costs are of little moment, for that home is going to be built regardless of the outlay required. In view of that, is the woodworking industry making a mistake when it sits back and awaits lower costs rather than make an attempt by general publicity and direct by mail literature, to create a desire for its product, which would result in a larger volume of business.

Some of the largest woodworking concerns on this continent have built up their business through advertising. They issue catalogues, pamphlets, booklets, which are attractively prepared and in which appear many, particularly colored, illustrations, and in this way they have succeeded in creating a desire for their products, which results in business from all parts of the country. Their trade is not confined to the locality in which their plants may happen to be, nor is it confined to any one state or province, but comes from all parts of the country, from coast to coast, shipments going to even the remotest districts.

There is a lesson here if we will but take it to heart. The size of the business which we can develop, depends entirely on the efforts we are willing to make.

WHEN THE ABILITY TO SERVE COUNTS MOST

When things are spotty; when your factory is filled up for a couple of weeks and then is practically empty; when even though you know lumber is a good buy, you are afraid to stock up and instead place rush orders for just what you need—then is when a time-tried lumber organization with a steadfast record for service and dependability, is a real asset. Our many years experience; our diversified and modern manufacturing facilities and the varied assortment of southern hardwoods, rotary veneers and plywood, are as well adapted to give satisfaction in filling to-day's hurried needs as in supplying big contracts in more normal times.

Regardless of your position, this organization merits your investigation.

ANDERSON-TULLY CO.

MEMPHIS

News of the Trade

The Watson Manufacturing Company and the Brantford Willow Works, both of Brantford, Ont., report that they are operating at 100 percent production.

Walter McLean, Wallaceburg, Ont., contemplates erecting a planing mill, and is desirous of securing prices on the necessary equipment.

A. & D. McGowan, 21 Main St., Toronto, have commenced work on a toy factory to cost $8,000.

The Bell Furniture Co., Limited, Southampton, Ont., closed down recently for two days, while erecting the new smokestack which is replacing the one blown down some months ago.

The Planahome Mfg. Co., Limited, Winnipeg, Man., was recently incorporated to manufacture and deal in woodwork and building materials of all kinds; capital $20,000. S. G. Layton and F. H. Mitchell are among the incorporators.

The Knechtel Kitchen Cabinet Co., Limited, of Hanover, Ont., has been authorized by supplementary letters patent to change their name to the Knechtel Kitchen Kabinet Co., Limited.

The Egan Phonograph Co., Limited, Toronto, has been incorporated to manufacture and deal in phonographs and other musical instruments, and to take over the business known as the Egan Phonograph Co.; capital $40,000. A. J. Trebilcock and J. F. Lennox, both of Toronto, are among the incorporators.

The name of Batts, Limited, Toronto, manufacturers of sash, doors and woodwork of all kinds, has been changed to the Buyers Door & Mfg. Co., Limited. J. S. Bond is managing director of the new concern.

The Alliston Wood Products, Limited, Toronto, has been incorporated to manufacture and deal in toys and wood specialties; capital $100,000. Among the incorporators are P. D. Trudell and L. E. Dougherty.

W. C. Wilson, formerly superintendent of the Meaford Mfg. Company's plant at Meaford, Ont., did not succeed in a suit against the above company for $7,000, alleged unpaid salary. The case was dismissed. Another claim of Mr. Wilson's, which had been filed against the McLagan Estate, has been withdrawn.

George F. Kretschmer, Sr., recently passed away at Louisville, Ky., after a brief illness of one week's duration. The late Mr. Kretschmer was president of the Southern Veneer Mfg. Co., of that city. He established this company in 1907, and held the position of president from its inception until his death.

Gigaire & Plante, Shawinigan Falls, P.Q., are constructing a dry kiln and office at a cost of $2,500.

The C. Beck Mfg. Co., Penetanguishene, Ont., presented that town with the grounds of the old Penetanguishene hotel, to be used for park purposes.

Canadian Cooperage Co., Limited, Moffats, N.B., was recently incorporated to take over the Canadian Fishing Transport Co., Limited, and to manufacture and deal in boxes, barrels and wooden containers; capital $50,000. F. M. Dyer and W. A. Sweet, both of New York City, and Hugh A. Carr, barrister, Campbellon, N.B., are among the incorporators.

The Everready Manufacturing Co. of Canada, Limited, Hull, Que., were recently granted a federal charter to acquire the Canadian and foreign rights of the Eveready Paper Fastener and to manufacture and deal in all kinds of office furniture and equipment; capital $200,000. Two of the incorporators are C. T. Murphy, Boston, Mass., and R. A. Upton, of Montreal.

National Household Appliances, Limited, Sackville, N.B., were recently granted a federal charter to manufacture and deal in washing machines, wringers and all kinds of household appliances; capital $400,000. J. Gueguen and E. H. Fillmore, both of Sackville, are two of the incorporators.

Star Trunk and Bag Mfg. Co., Limited, Montreal, were recently incorporated to manufacture and deal in all kinds of trunks; capital $49,000. I. Cohen and M. A. Greenblatt, both of Montreal ,are two of the incorporators.

Powley & Moody, Limited, Toronto, have been incorporated to manufacture and deal in automobiles, trucks, boats and all kinds of wooden vehicles; capital $100,000. Two of the incorporators are A. M. Dewar and A. Mills, barristers, both of Toronto.

The W. B. Pennock Co., Limited, London, Ont., was recently granted a provincial charter to manufacture and deal in automobiles, trucks, flying machines, boats and wood products of all kinds; capital $50,000. W. B. Pennock and A. R. Douglas, both of London, Ont., are two of the incorporators.

Kirsch Mfg. Co., of Canada, Limited, Woodstock, Ont., has been granted a federal charter to manufacture and deal in wooden specialties for interior decoration; capital $50,000. F. R. Buck and D. W. Hoxie, both of Sturgis, Mich., are two of the incorporators.

Lyons Bros., Toronto, who fitted up a woodworking plant some time ago, have now a complete installation devoted exclusively to the production of boxes for storage batteries. The wood used is chiefly oak and a very high quality of workmanship is required, as accuracy is a prime essential.

J. B. Morin, Limited, East Angus, Que., was recently incorporated to manufacture and deal in carriages, furniture, boats and wood products of all descriptions; capital $99,000. Two of the incorporators are J. J. Morin and F. Roberge, both of East Angus, Que.

V. G. Mongeau, Limited, St. Hyacinthe, Que., have been incorporated to manufacture and deal in coffins, caskets and boxes; capital, $30,000. J. Surprenant and L. Barceloux, both of St. Hyacinthe, are two of the incorporators.

At the annual meeting of the Peterborough Branch of the Engineering Institute of Canada, part of the entertainment consisted of moving pictures showing the various operations made in producing the ordinary barrel, the subject being covered from the felling of the trees to the assembling of the finished product.

Mr. Ramsden, Toronto representative of the Midland Woodworkers, Limited, Midland, Ont., has moved his office from 129 Spadina Ave., to 243 Pacific Avenue.

W. E. Harris Mfg. Co., Toronto, who were recently organized to manufacture and deal in sectional houses, have contracted with the Watt Milling & Feed Co. for a steady supply of sectional houses. It is anticipated that this business will assume large proportions.

Watt Milling & Feed Co., Limited, Toronto, recently completed a two-storey frame factory 40 x 110 feet. This was built to take care of the sectional

Three Questions—

could you answer them?

Do you ever consult your banker—Most likely—Then suppose your banker, for instance, asked you these three questions—could you answer them? Try it!

1. *How many hours of labor do you purchase each month?*
2. *How many were productive hours?*
3. *Are the records of your purchased and productive hours printed and unchangeable.*

They may be, and probably are, pertinent questions, and on them may rest the success or failure of an organization—yours perhaps.

If you can answer these three questions by the simple reference to records that are printed and unchangeable, you have complete control over what is today the costliest item of production—labor.

International Time Recorders and International Job Time Recorders give you the answers to these vital questions any time you care to refer to them for any month, any week, any day in the year. And those records are convincing too, because they cannot be changed.

We have a time recording system that will give you accurate information on the labor costs of your factory. A short talk with one of our representatives or some of our literature may prove of great value to you. No obligation attached to either—just say which.

International Business Machines SPEED ACCURACY ECONOMY

International Business Machines Co.

LIMITED

F. E. MUTTON, Vice-President and General Manager

Head Office and Factory: 300-350 Campbell Avenue, Toronto

HALIFAX, 44 Granville St. ST. JOHN, 18 Germain St. QUEBEC, 506 Merger Bldg. MONTREAL, 1 and 3 Notre Dame St. OTTAWA, 190 Queen St. TORONTO, 409½ Yonge St. HAMILTON, Room 8, 36 James St. S. LONDON, 489 Richmond St. WALKERVILLE, 44 Lincoln Rd WINNIPEG, 227 McDermott Ave. VANCOUVER, 110 Water St. SASKATOON, 254 Third Ave. S.

Also manufacturers of International Dayton Scales and International Electric Tabulators

house contract recently entered into with the W. E. Harris Mfg. Co. The material for these houses will be milled in the plant and carried to the new assembling building by an overhead carrier system. Here the different sections will be nailed up in forms so as to insure uniformity. Several new machines were added, in the shape of a horizontal boring machine and a Cowan variety saw, to take care of this work. These were supplied by the A. R. William Machinery Co., Toronto. If the demand warrants it, the output of sectional houses can be brought up to 25 buildings a week.

Maguire, Paterson & Palmer, Limited, have decided to instal match-making machinery in their splint factory at Pembroke. This is only a temporary measure to enable them to carry on until their plans for the construction of a large match factory are completed, the site chosen and the new factory put in operation.

The Northern Woodworkers, Limited, Bathurst, N.B., were recently incorporated to manufacture and deal in wood products of all kinds and take over the woodworking factory operated by Archibald E. Chapman, capital $24,900. A. A. Chapman, John McIntosh and Stewart Chapman, of Bathurst, N.B., are among the incorporators.

H. J. Atcheson has opened up a cabinet-making and general woodworking shop at 2256 Queen St. East, Toronto.

The Montreal Pattern Works, 242 Clarke St., Montreal, was recently reorganized. A. E. Porteous is now the business manager and John S. Grant, secretary. This firm does a general wookworking business as well as makes patterns in both wood and metal.

The Stratford Housing Company, Limited, of which D. N. Wright, managing-director of the McLagan Furniture Co., is president, contemplate erecting fifty houses. The plans for these residences have been prepared, and are being submitted to the provincial director for approval. It is anticipated that tenders will be called for and the work undertaken in the near future.

A unique building event took place in Weston, Ont., just outside Toronto, recently, in which four houses were completed in a single day. A start was made at 6 a.m., and by 11 a.m. the four buildings were complete. The builders were A. E. LePage, bungalow specialist, Toronto, The Brantford Sectional House Co., which is connected with Schultz Bros. & Co., Brantford, Ont., the Harris Ready Cut House Co., Toronto, and Carl Seymour, Toronto.

Henry McKenna recently passed away at his home at Elora, Ont. Mr. McKenna was an upholsterer by tarde, and was with Morlock Bros. for a number of years. More recently he was in the employ of the John C. Mundell Co., Elora.

A recent ruling of the Department of Agriculture is to the effect that the standard berry box must be used this year. This means that the use of the smaller box which has been on the market during recent years will not be legal under the present ruling.

The manufacturers of British Columbia contemplate holding a Made-in-B. C. Week from June 20th to 25th inclusive. The co-operation of practically all manufacturers has been secured, together with the support of various boards of trade and other societies, and it is thought that this movement will succeed in boosting B. C. products.

Mr. R. B. Morley, general manager and secretary-treasurer of the Ontario Safety League for the past seven years, has resigned his position to become secretary-treasurer of the Industrial Accident Prevention Association, an organization formed under the authority of the Workmen's Compensation Act. Mr. J. F. H. Wyse, formerly organizer and engineer of the Safety League, has been appointed to fill the vacancy caused by Mr. Morley's resignation. The executive committee of the Safety League has made Mr. Morley honorary secretary.

Appointed Canadian Distributing Agents

The veneer and panel plant at Waterville, P.Q., which was recently equipped by the Waterville Veneer & Panel Co., is now in operation. The machines installed in this factory are the latest known to the veneer manufacturing industry, and as a consequence a high quality product should result. The output consists of rotary cut veneers in birch, basswood, maple, etc., and built-up panels faced with any of the better known cabinet woods, such as oak, walnut, gum, birch, etc. This material can be had in stock sizes or made to special dimensions. A line of cheaper plywood for case backs and drawer bottoms is being turned out.

Robert Bury & Co., Limited, Toronto, have been appointed special distributing agents for this line in Canada, and will handle all the Canadian business. This leaves the Waterville organization free to devote their full attention to manufacturing.

The Talge Mahogany Co.
INDIANAPOLIS

Offers you the most exclusive line of
Foreign and Domestic Veeners and Lumber

We specialize in
Mahogany, Walnut and Oak

No Order too Small—No Order too Large

Once upon a time

Why our Gum does not stain

Gumwood was despised; considered a cheap unreliable wood. Today its use predominates in the higher grade manufactures and crafts.

What has brought about this change?

Intrinsic merit partly, but **improved methods of production, handling and treatment are the important contributing factors.**

True, some manufacturers, attracted by low prices on an inferior product of Gumwood, lacking the necessary care and attention in handling and treatment, continue having some difficulty, but this is **unnecessary and tremendously expensive.**

The **right kind of Gumwood** offers to the purchaser the greatest value for the money expended of any wood on the market.

The price of the best is so low—intrinsic value considered—that it is folly to be tempted by a slightly lower price on inferior stock.

The lowest intial cost invariably means a higher ultimate cost. **It is the ultimate cost that determines value.**

Our Kraetzer-Cured Gumwood represents the acme of quality and dependability: as straight and flat as any wood, and bright, free from the stain and discoloration, which many people think must be expected in the sap part of Gumwood.

And uniform—one board like another; one car like another. These things can be accomplished by **no other means** and obtained from **no other source.**

Only the very rich can afford the extravagance of poor quality. Every board is branded.

One reason why our Gum is Straight and Flat

THE KRAETZER-CURED LUMBER CO.

Our protection—Your guarantee

The Kraetzer-Cured Lumber Co.

GENERAL OFFICE: GREENWOOD, MISS.

Band Mills: Greenwood, Miss., Moorhead, Miss.

Our Quartered and Plain Red and White Oak, Ash, Hickory, Red Gum and Tupelo are as fine as the highest quality of virgin timber and thorough knowledge of production can produce.

THERE IS NONE BETTER.

Sunken Joints in Furniture Panels

The use of heavy and light material of the same species in laminated or glued-up wood construction has less injurious effect than has been generally supposed. Laminated wood specimens under observation at the Forest Products Laboratory show little weakening or tendency to warp from this cause. Most warping and checking in laminated construction can be traced to one of two causes. The first is the use of plain-sawed and quarter-sawed lumber in the same construction, and the second is the combination of material of different moisture content.

Plain-sawed lumber of any species shrinks and swells more than quarter-sawed lumber; and when the two kinds are glued together, they pull against each other with every change in moisture content. If the block containing such a combination is kept for a long time in the same atmospheric condition, the stresses die out, because the block checks or changes tured, the stresses will disappear permanently in time, but the block will have changed its shape someshape more or less to relieve the stretched condition of its fibers. As soon as the atmospheric conditions change, new stresses will be set up.

If boards of different moisture contents are glued together, internal stresses will result from the unequal shrinkage of the boards as their moisture contents equalize through seasoning. In some blocks made at the laboratory these stresses were large enough to rupture the wood. If the wood is not ruphat in getting rid of them.

Stresses in Laminated Construction

A defect in manufacture known as a sunken joint is sometimes noticeable in thick panels, especially tops of tables, desks, and other pieces of furniture. This defect appears as a long, shallow depression in the surface, and may be very conspicuous when viewed at certain angles.

In modern practice furniture tops are generally built up of five plies of wood, consisting of a thick core, cross banding, and faces. The core is usually made of a number of pieces of lumber glued together. Investigation shows that the defect in question occurs over joints in the core stock.

The Forest Products Laboratory finds that too rapid progress in the preparation of the core is the basic cause of sunken joints. The wood next the joint absorbs moisture from the glue and swells. If insufficient time is allowed between the gluing of the joints and surfacing of the core, which is the next step in manufacture, more wood will be removed at the joints, because of the greater swelling there than at intermediate points. During subsequent drying and seasoning, greater shrinkage takes place at the joints, causing permanent depressions.

The remedy for sunken joints is an extension of the seasoning period between gluing and planing. The proper length of this period will vary with the thickness and species of wood, and atmospheric conditions, but it should be long enough to allow the moisture added by the glue to evaporate or to distribute itself through the wood.

The Sidman Lumber Curing Kiln

We have read with interest an article in the May WOODWORKER by MR BENJ D. CURTIS, on the necessity of even distribution of heat in a Dry Kiln to properly dry lumber.

This is one of the points that has made THE **SIDMAN LUMBER CURING KILN the SUCCESS IT IS.** You will note that the pipe works shown to illustrate the article, are all bunched in the bottom of the kiln, with practically no difference as to the diffusion of heat, simply of different design.

Our heating pipes are arranged part way up on each side wall, and in Class D (Pocket) Kilns across the back wall, then drop, and the pipes are run to the front of the kiln under the lumber just below the rails. We also take care of the COLD END or ENDS that are covered by the door or curtain, by a special arrangement of our piping, something that is not done by others, so that each and every part of our kiln will show the same degree of heat at all times. Our heating system is automatically controlled by the way the radiation is laid out, and this even distribution of heat combined with our POSITIVE CROSS VERTICAL SYSTEM OF VENTILATION, can not fail to give the best results so far obtainable, in drying lumber properly. Where various degrees of temperature are desired, we use a special Thermostat.

Write us for the nearest user of our kiln, go and see the kiln and talk to the owner.

ALL SIDMAN KILNS ARE MADE IN CANADA. NO LONG HAUL FREIGHT CHARGES, DUTY, OR EXCHANGE ON MONEY TO PAY.

THE SIDMANS of CANADA

LONDON ONTARIO

IN TRANSIT YARD
TORONTO

Million Feet Bone Dry Hardwoods

Orders can be filled immediately

PHONE MAIN 210

705 Excelsior Life Building, Toronto

Anderson-Miller Lumber Co., Limited

H. W. PETRIE
LIMITED

CANADA'S DEPENDABLE
MACHINERY and
SUPPLY HOUSE

NEW AND USED
WOODWORKING MACHINERY

Let us Quote on Your Requirements

131-147 FRONT STREET WEST TORONTO

HAMILTON OFFICE: 4 KING STREET WEST

General Woodworking Trade Mart

Quick Action Section

Equipment Materials Employment

For Sale

Sash, door and planing mill machinery, boilers, engines, motors, pulleys, gears, machine shop and moulding machinery. 8 ft. Linderman glue jointer. Full printed list on request. Cargill Limited, Cargill, Ont. 3-6

List of MACHINERY

for disposal at Factory

KITCHENER, ONT.

(Subject to Prior Sale)

No.

3 Rip Saw Table, Iron Top (Goldie-McCulloch).
6 Embossing Machine (Am. Woodworking Machinery Co.)
7 Glue Spreader, 1911, Power Feed (Hide Glue), (G. R. Veneer Co.)
8 Single Section Wood Frame Veneer Press.
9 Fox Dods Machine, 62".
11 Spindle Carver.
12 No. 9 Double Disc Sander, 24".
14 12 Spindle Dovetailer.
19 2 Old Rubbing Machines, Maddox Short Belt.
23 No. 10-1915 Valley City Special Twist Roping Machine, 6'.
24 Small Double Mitre Saw for chair seat rails (McG. G.)
25 No. 4 Reynolds Screw Driving Machine, 2 magazines.
26 Edge Sander Maddox.
31 Steaming and Bending Tank, 8 x 48.
32 Bending Machines, Chair Back Bender.
33 Double Drum Sander, 2-24" x 24, with 42" desk on one end (McG. Gourlay).
34 Double Spindle Oscillating Sander Feed, 5/8 x 1 1/8 Spindles (J. Cochrane).
35 Multiple A 10886 Drum Sander, 6-12-18-24, diameter 12" (McG. Gourlay).
36 No. 83 Universal 1916 Combination Belt and Spindle Sander.
37 Double Mitre Saw Maddox.

Furniture Factory For Sale

Situated in British Columbia. Good equipment. Line includes upholstered furniture. Turnover last year $50,000. This can be greatly increased. $8,000 will handle. Apply Box 109, Canadian Woodworker, Toronto.

For Sale

Two-storey Brick Factory Building, also Store House, Dry Kiln, Boiler, Engine, and number Woodworking Machines. Located on large lot adjoining C. P. Ry. Splendid opportunity. Apply Box 949, Owen Sound.

GOOD VALUES

Subject to Prior Sale

Sticker, Hermance Machine Co. 10" 4 Side.
Moulder, Woods No. 2 10" inside.
Moulder, American 10" 4 Side.
Sander, Endless Bed 48" H. B. Smith.
Belt Sander, Curtis No. 20.
Sander, Moore Machine Co. Standard.
Matcher, American No. 229 Fast Feed Hardwood Flooring.
Matcher, American No. 22 24" 4 Side.
Band Resaw, Connell & Dengler 60".
Band Resaw, Mershon 44".
Band Rip Saw, American No. 1 Power Feed.
Circular Saw Mill, Hoosier Pony.
Jointer, Falls Machine Co., Undercut 24" Power Feed.
Buzz Planer, 24" Buss Machine Works.
Lathe, Back Knife Clement 36".
Planer, 30" Fay & Egan Single Cabinet.
Dowell Rod Machine, E. B. Hayes.
Dowell Gluer and Driver, E. B. Hayes.
Door Clamp, E. B. Hayes Standard Powers.

Woodworking Machinery Company of Buffalo,
54 Mechanic St.,
Buffalo, N.Y.

Road Construction in Fukien Province

The military governor of Fukien Province, China recently commenced the construction of modern roads between Yungchun and Chuanchun, Huyang, and Tehu. The roads are being constructed of macadam with a width of 40 feet in the towns and of 25 feet in the country. The actual construction work is being done by Chinese engineers who have had experience in Singapore. It is planned to run a motor omnibus and freight service on the roads when completed.

Brick Makers and Government Bureau to Study Brick

Negotiations are in progress looking to a co-operative agreement between four associations of brick manufacturers and the U. S. Bureau of Mines and the U. S. Bureau of Standards. The plan is to make a comprehensive study of certain of the fundamental problems in ceramics which are confronting the manufacturers of brick. A substantial sum is to be made available for that purpose.

Highway Work in Oregon

In the biennial report of the Oregon State Highway Department it is recommended that the activities of the department in 1921 be confined to the improvement of roads already embraced in the present system of state highways. The report shows that the state system of highways includes 20 routes with a total mileage of 2,976 mi., exclusive of sections included in cities and towns. Of this total, 1,944 mi. are improved.

INVESTIGATE IMMEDIATELY

We warrant the following used and rebuilt Wood Working Machines.

1 Woods 15 X 6" Planer & Matcher.
1 MacGregor 26 X 8" Double Surfacer.
1 Yates 30 X 6" Double Surfacer (rebuilt)
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1 RogersNo. 6 R.H. Saw Sharpener (new)
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1 Ballantyne Self Feed Rip Saw
1 Jackson Cochrane 3 Drum Sander
1 MacGregor Mortiser
1 C.M.C. Sash Moulder 6"
1 C.M.C. 12" Buzz Planer
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1 Woods 24 X 6" Planer & Matcher
1 MacGregor 10"—4 side Moulder
1 Smith 10"—4 side Moulder
1 New Britain Chain Mortiser
1 Greenlee Hollow Chisel Mortiser
1 Morgan No. 8—26" Nailing Machine, open back
1 Jackson Cochrane 12 spindle Dovetailer
1 Cowan 12" Buzz Planer
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Limited
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for making mitered, butt or any other joint
Used by all leading Furniture, Cabinet and Casket Manufacturers.

In using "*Steelgrip*" CLAMP NAILS only the ordinary machine work is required. Cut a slot, drive in a "Steelgrip," that's all. No clamping, no waiting for glue to set.

"*Steelgrip*" CLAMP NAILS
Save Time + Labor = Money
Produce, Strength + Durability = Better Product

For sale by dealers in Cabinet Hardware, or direct if you so prefer.

CLAMP NAIL COMPANY
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CIRCULARS and SAMPLES ON REQUEST.

Subscribers' Information Form

Many letters reach us from subscribers enquiring where certain goods can be obtained. We can usually supply the information. We want to be of service to our subscribers in this way, and we desire to encourage requests for such information. Make use of this form for the purpose.

Date.....19

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345 Adelaide St., West, Toronto

Please tell us where we can secure (give description as fully as possible) .....

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Manufacturers
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AND
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Send your specifications
to us at
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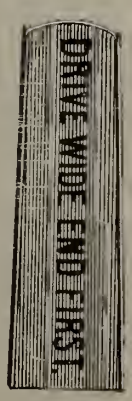

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The best labor saving device made, for making mitered joints for Furniture, Cabinet, Table, Phonograph and Casket Manufacturers.

Write for samples and prices.

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"The change will come overnight"

said a prominent banker the other day in discussing the expected mid-summer change from present conditions to a real upward swing of business activity.

"The present situation is largely a mental condition, it will go as suddenly as it came"

The time to improve your boiler equipment is now.

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Hall Machinery Co., Sherbrooke Que., and Birk's Bldg., Montreal.

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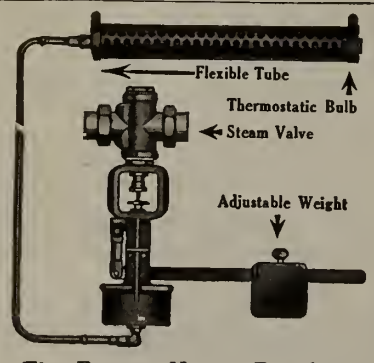


The Powers No. 15 Regulator

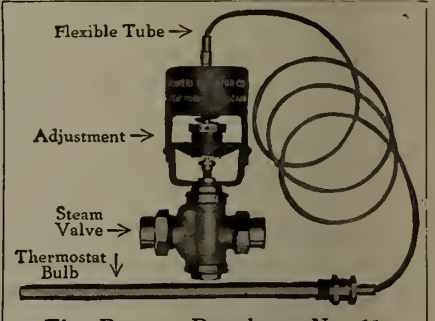
Here is a regulator that will control your dry kiln, or your varnish room, or other similar process, saving fuel and improving product.
Send for Bulletin 138.

Responsibility is irksome to some men—routine to others.

Automatic control of temperatures relieves men of both responsibility and routine—it helps to relieve the "spirit or unrest," which seldom occurs where tasks are not irksome.

Some of the Causes!

Begin now to eliminate some of the causes of discontent by putting Automatic Heat Regulators on your dry kilns, ovens, varnish and dry rooms, heating systems, hot water tanks, shower baths—and every place where heat control is desired.



The Powers Regulator No. 11

Specially adapted for the control of liquid temperatures as in hot water tanks, glue pots, dry kettles, etc. Entirely automatic and self contained requiring no outside power for operation.
Send for Bulletin No. 129.
other designs for other uses, wherever heat control is desirable.

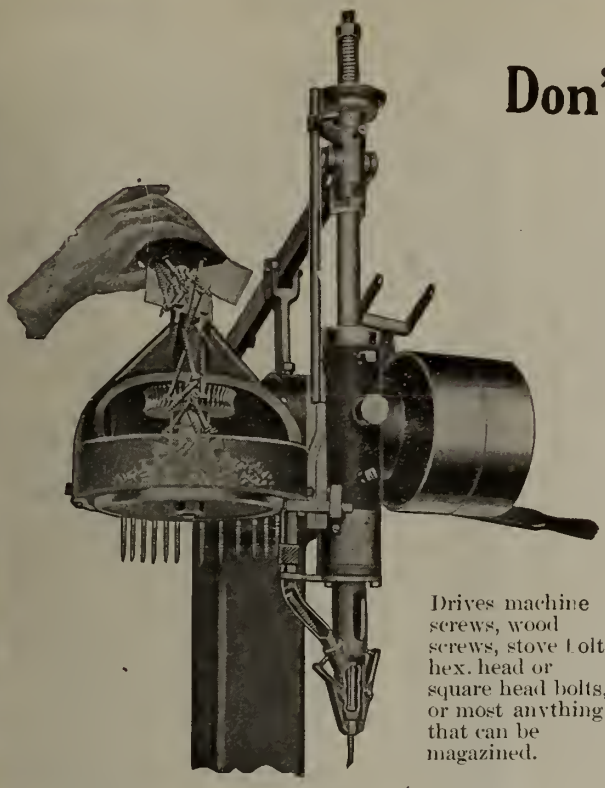
Powers Heat Regulators

These accurate, dependable machines positively and automatically control the heat at the point of use. Their economy is fourfold.

1. They save labor by releasing men who now attempt to control heat by hand.
2. They save material by preventing losses from spoiled or sub-standard output.
3. They save fixtures by preventing overheating.
4. They save fuel by using only necessary heat.

We have spent more than thirty years in studying temperature control and have gained a vast fund of practical information which is cheerfully at your service.

The Canadian Powers Regulator Co., Ltd. SPECIALISTS IN AUTOMATIC HEAT CONTROL **82 Chestnut St., Toronto, Ont.**



Drives machine screws, wood screws, stove bolts, hex. head or square head bolts, or most anything that can be magazined.

Don't waste time and money driving screws by hand

Follow the example of your competitors and install Magazine Fed Screw Driving Machines

The
Reynolds Machine Co.
Department C.
Massillon, Ohio, U. S. A.

Robertson Patented Socket Head Wood Screws

Take the *high costs* out of Screw - driving

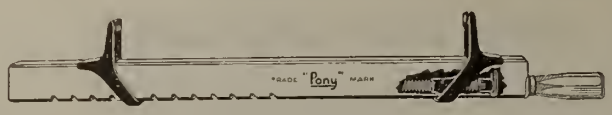
No matter whether you use automatic screw-driving machines or the hand method, you will find them far superior to work with.
Note the patented recess head as shown in the illustration. When the driver is set in it there is no chance of it slipping out and all burring is eliminated. The result is a clean, neat-appearing job that adds to the value of your product.

Many manufacturers are now using them exclusively and are all delighted with the results. **Drivers supplied free with first orders, and include** hand drivers, Yankee bits, brace bits or bits for the Reynolds machine, which gives exceptional efficiency when using recessed head screws. Send post card for free samples with bits which will prove our contention of double efficiency and savings in time, labor and annoyance, worth more to a large screw user than his entire outlay in buying screws.

P. L. Robertson Mfg. Co., Ltd.

Milton - - - Ontario

"Pony" Cabinet Clamp



For lightness combined with strength this clamp has no equal. All parts are selected from the best materials obtainable and we have spared no effort to make the "Pony" the finest thing of its kind on the market. Made in sizes to open 18 in. to 72 in.

"Jorgensen"

Peerless Adjustable Hand Clamp

Fits every grip without a slip and takes a tighter hold with less effort. It is a tool of real economy and a clamp that insures efficiency.

Adjustable Clamp Company

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Colt's Clamps

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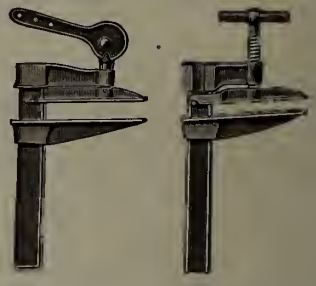
Woodworker



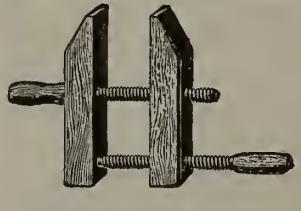
Colt's Universal and Vise Clamps are unsurpassed for the Furniture Manufacturer and General Woodworker. They are made right, both in design and quality of materials and workmanship.

Colt's Clamps are quick-acting and have broad jaw clamping surface.

For further information write for Catalogue No. 294.

Batavia Clamp Co.

235 Centre St. **BATAVIA, N. Y.**



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Manufactured by

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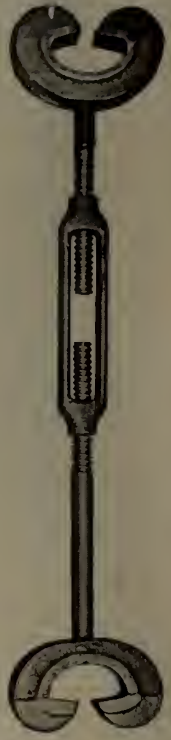
Better work follows the use of the "Empire"

There is no question about it. EMPIRE all steel clamps do the work with less chance of failure than any other you can purchase. In scores of shops where they are in daily use results bear out the truth of this statement. If you will try them once you will be convinced.

Get in touch with us now. We can make prompt delivery from stock.

We specialize in all types of woodworking tools.



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Let us tell you about the machine.

Testimonials from hundreds of satisfied users.

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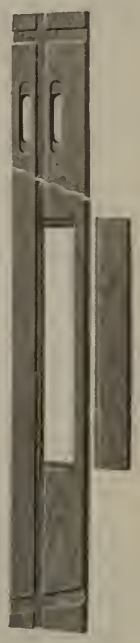

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"The Canada Lumberman" is published in the interest of, and reaches regularly, persons engaged in the lumber, woodworking and allied industries in every part of Canada. It aims at giving full and timely information on all subjects touching these interests, and invites free duscussion by its readers.

Advertisers will receive careful attention and liberal treatment. For manufacturing and supply firms wishing to bring their goods to the attention of owners and operators of saw and planing mills, woodworking factories, pulp mills, etc., "The Canada Lumberman" is undoubtedly the most direct and profitable advertising medium. Special attention is directed to the "Wanted" and "For Sale" advertisements. Sample copy and full information on request. Head Office, 349 Adelaide St. West, Toronto.

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BRANCHES OF THE WOODWORKING INDUSTRY, AN OUTPUT OF 129,888,000 FEET PER ANNUM

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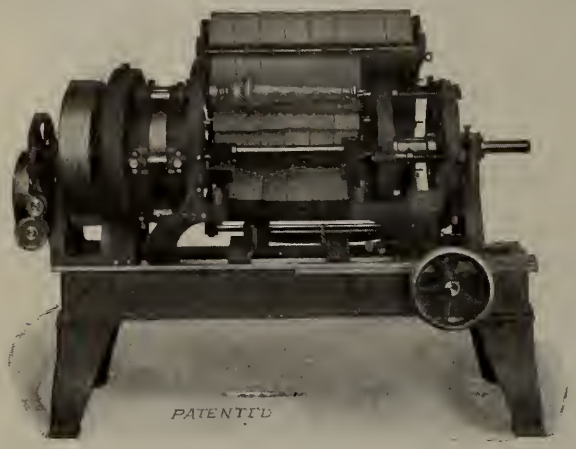


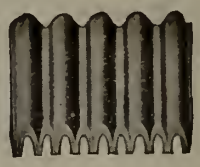
that will help you to reduce costs and eventually prices.

The Nash No. 10 Sander for furniture turnings can do the work of from 5 to 15 men and do it better.

Just ask me to prove this.

J. M. NASH, Milwaukee, Wis.

Cary's SUPERIOR QUALITY Corrugated Fasteners



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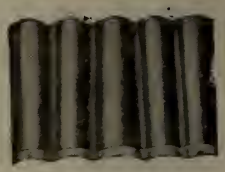

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According to final decision, after long litigation, we have been granted the SOLE RIGHT to manufacture a Saw Tooth Corrugated Fastener with a continuous cutting edge. Our fastener is beveled evenly on both sides, which enables fasteners to be driven in straight, and much easier than any other fastener made. Our Corrugated Fastener is made in various widths and corrugations, also in coils wound right and left. Try our products and you will use no other.

Samples and prices on request.

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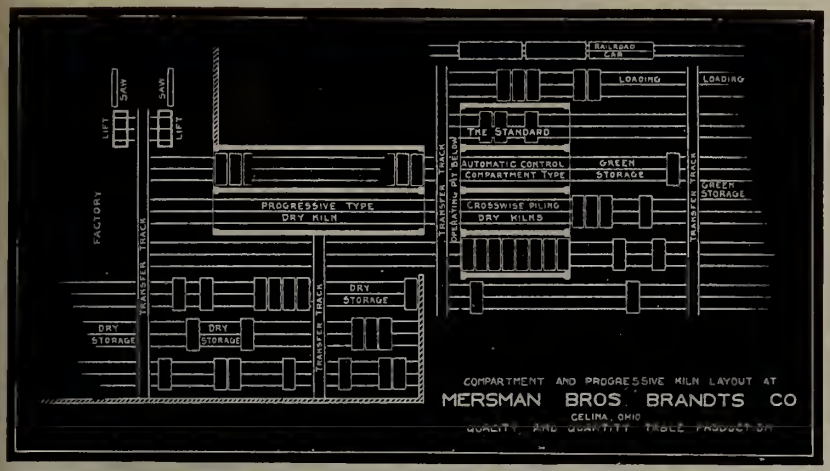

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The Standard Dry Kiln Co.

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In order that you may enjoy the proper spirit at that eventful time we suggest that you INVESTIGATE

NATIONAL Automatic Humidity Controlled **DRY KILNS**

NOW

The first kilns in 6000 years in which humidity is Automatically Controlled

They will surely be a great help in insuring you high spirits at Christmas Time and

ALL THE TIME - - May we prove this to you?

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DOWEL MACHINES
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.

DOWELS
Canada Wood Specialty Co., Ltd., Orillia, Ont.

DRY KILNS
Canadian Blower & Forge Co., Kitchener, Ont
Cutler Desk Co., Buffalo, N. Y.
Curtis-Hosey Dryer Co., Montreal, Que.
Grand Rapids Veneer Works, Grand Rapids Mich.
National Dry Kiln Co., Indianapolis, Ind.
Sidmans, London, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

DUST COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

DUST SEPARATORS
Canadian Blower & Forge Co., Kitchener, Ont.

EDGERS (Single Saw)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Radcliff Saw Mfg. Co., Toronto, Ont.

EDGERS (Gang)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

EDGER SAWS
Atkins & Co., E. C., Indianapolis, Ind.

ELECTRIC SUPPLIES
Northern Electric Co., Montreal, Que.

ENAMELS
Celluloid Zapon Co., New York.

END MATCHING MACHINES
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont
Yates Machine Co., P. B., Hamilton, Ont.

EXHAUST FANS
Canadian Blower & Forge Co., Kitchener, Ont
Garlock-Walker Machinery Co., Toronto, Ont

EXHAUST SYSTEMS
Canadian Blower & Forge Co.
Neville-Cooper Co., Toronto.

FIBRE CORD
Grand Rapids Fibre Cord Co., Grand Rapids.

FEED ROLLS
Atkins & Co., E. C., Indianapolis, Ind.

FINISHING PRODUCTS
Campbell Co., M. L., Kansas City, Mo.

FLOORING MACHINES
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

FURNITURE LEATHER
Eagle-Ottawa Leather Co., Grand Haven, Mich.

FURNITURE TRIMMINGS
Foster, Merriam Co., Meriden, Conn.

GARNET PAPER AND CLOTH
Carborundum Co., Niagara Falls, N.Y.
Macdonald, Norman, Toronto, Ont.
Oakey & Sons, Limited, John, London, S.E.I. (Wellington Emery & Black Lead Mills).

GRAINING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Yates Machine Co., P. B., Hamilton, Ont.

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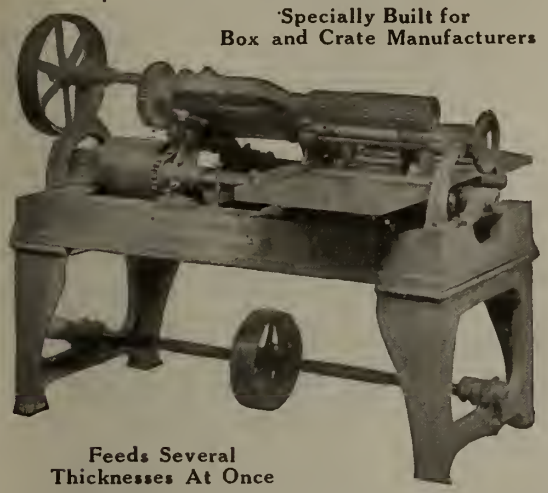
"The Chattanooga" — Just Another Name For Fast, Economical Gang Ripsawing

Specially Built for Box and Crate Manufacturers



Feeds Several Thicknesses At Once

This latest improved gang ripsaw is powerful, fast, safe and eliminates wastage. For gang sawing boards into strips or head sticks and for ripping veneers it is unsurpassed.

Has powerful feed and securely holds down and feeds short pieces. The feed rolls are automatically adjustable to varying thicknesses. Upper rolls are driven by cut gears, and the lower ones by sprocket chain. Several thicknesses of veneering can be fed thru machine at one time.

The CHATTANOOGA is an unusually big producer, easily operated, and turns to profitable account short stuff lying around a mill—otherwise wasted.

Attractive price. Complete information on request

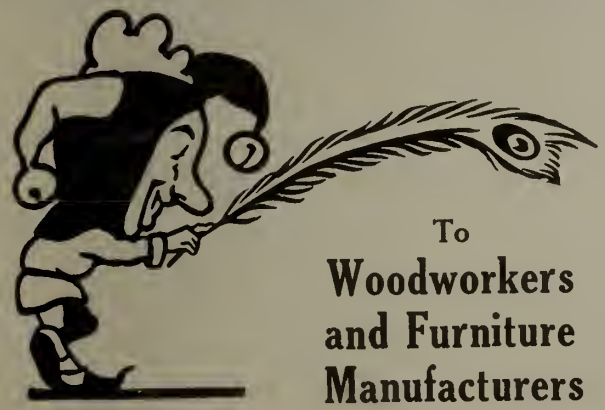
Chattanooga Machinery Company
Chattanooga, Tenn.

We Manufacture a complete line of

Chair, Cane-Cutting and Bending Machines

CUTS AND CATALOG UPON REQUEST

L. G. McKnight & Son Co.
GARDNER, MASS.



To
Woodworkers and Furniture Manufacturers

Your requirements in Reed Forms for Wicker Work Furniture, Mechanic's Tool Cases, Dowels, Novelties, Cedar Chests, Piano Lamps, Table Lamps, etc., can be promptly supplied by us.

We are always pleased to quote prices and give any information you may desire. Try us on your next order.

THE
Brantford Pattern Works
BRANTFORD

Sale of Machinery

We are offering for cash the following machines only, at prices which speak for themselves. Bring your mechanic to inspect them:—

1	Automatic Knob Machine, with quantity of cutters	$ 100.00
1	Jig Saw, Goldie & McCulloch	75.00
1	Jig Saw, McGregor-Gourlay, wood top	50.00
1	American Double Disc, 36" Sander, adjustable tables	250.00
2	American Three-screw Veneer Presses, 38" wide. Each	50.00
1	Gravity Swing Cut-off Saw, McGregor-Gourlay	75.00
1	12" Moulder, Cowan & Co., 4-sided	650.00
1	16" Buzz Planer, Clark-Demill	175.00
1	No. 5 Buffalo Blower	50.00
1	No. 3 Sturtevant Blower	25.00
1	Band Saw, 34", McGregor-Gourlay	175.00
1	Chisel Mortiser, McGregor-Gourlay	125.00
1	Tennant Machine, McGregor-Gourlay	200.00
1	3-sided 7" Cowan & Co. Moulder	200.00
1	Chaser Grinder, Modern Tool Co.	100.00
1	Double Exhauster, 45", American Blower Company	150.00
1	C. M. C. No. 212 Double Surfacer, 30"	1,000.00
1	Sash Sticker, H. W. Petrie	75.00
1	No. 3 Weymouth Lathe for Handles	225.00
1	Dowelling Machine, M31, Cowan No. 2, cap. up to 2½"	300.00
1	S. A. Woods Matcher and Planer, 15" x 6"	1,400.00

Other machinery and supplies at corresponding prices

General Machinery Company
67-69 Frederick St., Toronto
TELEPHONE MAIN 2200

"Canadian Woodworker" Buyers' Directory—Continued

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GLUE
Casein Mfg. Company, New York, N.Y.
Casein Glue Mfg. Co., Chicago, Ill.
Perkins Glue Company, South Bend, Ind.
Sampson & White, London, England.

GLUE CLAMPS
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane, & Company, Kitchener.

GLUE HEATERS
Fay & Egan Co., J. A., Cincinnati, Ohio.
International Electric Co., Indianapolis, Ind.
Jackson, Cochrane, & Company, Kitchener.
Pringle, R. E. T., Toronto, Ont.

GLUE JOINTERS
Casey Co., M. E., Montreal, Que.
Jackson, Cochrane & Company, Kitchener, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GLUE SPREADERS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener.

GLUE ROOM EQUIPMENT
Perrin & Company, W. R., Toronto, Ont.

GRINDERS (Cutter)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

GRINDERS (Knife)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDERS (Tool)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GROOVERS
Atkins & Co., E. C., Indianapolis, Ind.

GROOVING HEADS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Mattison Machine Works, Rockford, Ill.

GUM LUMBER
Aberdeen Lumber Co., Pittsburg, Pa.
American Hardwood Lumber Co., St. Louis, Mo.
Anderson-Tully Co., Memphis, Tenn.
Barr-Holaday Lumber Co., Greenfield, Ohio.
Brown & Co., George C., Memphis, Tenn.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Darnell-Love Lumber Co., Leland, Miss.
Gum Lumber Association, Memphis, Tenn.
Hyde Lumber Company, South Bend, Ind.
Merceau-Hawkins Tie Co., Huntington, W.Va.
Paepcke-Leicht Lumber Co., Chicago, Ill.
Sondheimer Co., E., Memphis, Tenn.
Steele & Hibbard Lumber Co., St. Louis, Mo.

HAND SCREWS
Fay & Egan Co., J. A., Cincinnati, Ohio.

HANDLE & SPOKE MACHINERY
Fay & Egan Co., J. A., Cincinnati, Ohio.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Whitney & Son, Baxter D., Winchendon, Mass

HARDWARE
Laidlaw Bale-Tie Co., Hamilton, Ont.
Weber-Knapp Co., Jamestown, N.Y.

HARDWOOD DIMENSION STOCKS
Brown Bros. & Co., New York.

HARDWOOD LUMBER
American Column & Lumber Co., Columbus, Ohio.
American Hardwood Lumber Co., St. Louis, Mo.
American Oak Mfrs.' Assn., Memphis, Tenn.
American Walnut Association, Washington, D.C.
Anderson-Miller Co., Toronto, Ont.
Anderson, Shreiner & Mawson, Toronto, Ont.
Anderson-Tully Co., Memphis, Tenn.
Arkla Lumber & Mfg. Co., St. Thomas.
Arrow Lumber Co., Parkersburg, W. Virginia
Atlantic Lumber Company, Toronto, Ont.
Bacon Lumber Co., Cleveland, Ohio.
Banning, Leland G., Cincinnati, Ohio.
Barr- Holaday Lumber Co., Greenfield, Ohio.
Barlett Lumber Co., W. C., Charleston, Va.
Bedna Young Lumber Co., Jackson, Tenn.
Biglow-Cooper Co., Bay City, Mich.
Bonner & Sons, J. H., Memphis, Tenn.
Brown Bros. Co., New York.
Brown & Company, Geo. C.
Brown & Hackney, Inc., Memphis, Tenn.
Bruce Co., E. L., Little Rock, Ark.
Burns & Knapp Lbr. Co., Conneautville, Ohio.
Bury & Company, Robert, Toronto, Ont.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Conkling Lumber Co., Frank A., Memphis, Tenn.
Canadian General Lumber Co., Toronto, Ont.
Chicago Mill and Lumber Co., Chicago, Ill.
Clark & Sons, Edward, Toronto.
Dacus-Richards Hardwood Co., Memphis, Tenn.
Darnell-Love Lumber Co., Leland, Miss.
DeHewit Lumber Co., Huntington, Va.
Dooley Lumber Co., F. T., Memphis, Tenn.
Evansville Band Mill Co., Evansville, Ind.
Frye Lumber & Veneer Co., J. W., Dayton, O.
Gayoso Lumber Co., Memphis, Tenn.
Gill Lumber Co., Chas., Wausau, Wis.
Hall Lumber Co., Thos., Charleston, W.Va.
Heeney, Percy E., Kitchener, Ont.
Hyde Lumber Co., South Bend, Ind.
Kosse, Shoe & Schleyer Co., Cincinnati, O.
Kraetzer-Cured Lumber Co., Greenwood, Miss.
Leach & Co., J. D., Chicago, Ill.
Liverpool Hardwood Co., New York.
London Lumber Co., London, Ont.
Long-Knight Mfg. Co., Indianapolis, Ind.
Luehrman Hardwood Lbr. Co., St. Louis, Mo.
May Bros., Memphis, Tenn.
McLean Mahogany & Cedar Co., Buffalo, N.Y.
McLennan Lumber Co., Montreal, Que.
Memphis Band Mill Co., Memphis, Tenn.
Mengel Co., Louisville, Ky.
Merceau-Hawkins Tie Co., Huntington, W.Va.
Mowbray & Robinson, Cincinnati, Ohio.
Murrelle Lumber Company, Memphis, Tenn.
Nicholson & Co., E. M., Montreal, Que.
Nichols & Cox Lumber Co., Grand Rapids, Mich.
Otis Mfg. Co., New Orleans, La.
Paepcke Leicht Lumber Co., Chicago, Ill.
Payson, Smith Lumber Co., Minneapolis, Minn.
Pedwell Hardwood Lumber Co., Toronto, Ont.
Perkins Bros., Kelso, Ark.
Peytona Lumber Co., Huntington, W. Va.
Pickrel Walnut Co., St. Louis, Mo.
Powe Lumber Co., Thos. E., St. Louis, Mo
Ritter Lumber Co., W. M., Columbus, Ohio
Rush Lumber Co., Memphis, Tenn.
Sawyer Goodman Co., Marinette, Wis.
Sondheimer Co., E., Memphis, Tenn.
Spencer, C. A., Montreal, Que.
Spotswood & Son, E. R., Lexington, Ky.
Stark & Co., Jas. E., Memphis, Tenn.
Steele & Hibbard Lumber Co., St. Louis, Mo.
Sterrett, Will S., Cincinnati
Stimson Hardwood Co., J. V., Memphis, Tenn.
Stimson & Co., J. V., Owensboro, Ky.
Tallahatchie Lumber Co., Memphis, Tenn.
Tennessee Lumber & Coal Co., Cincinnati Ohio.
Thompson, Katz Lumber Co., Memphis, Tenn.
Thompson & Co., Lewis, Philadelphia, Pa.
Upham & Walsh, Chicago, Ill.
Utley-Holloway Co., Chicago, Ill.
Vail Cooperage Co., Fort Wayne, Ind.
Warren-Ross Lumber Co., Jamestown, N.Y.
Wheeler-Timlin Lumber Co., Wausau, Wis.
Whiting Co., Wm. S., Johnson City, Tenn.
Wisconsin Lumber Co., Chicago, Ill.
Wayne Lumber Co., New York
Wood Mosaic Co., Louisville, Ky.
Yellow Poplar Lumber Co., Coal Grove, Ohio.

HYDRAULIC VENEER PRESSES
Perrin & Company, Wm. R., Toronto, Ont.

INSURANCE
Lee Blakemore, Inc., Toronto, Ont.

KNOBS
Waddell Mfg. Co., Grand Rapids, Mich.

JOINTERS
Canada Machinery Corporation, Galt, Ont.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

KNIVES (Planer and others)
Atkins & Co., E. C., Indianapolis, Ind.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

LATHES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Defiance Machine Works, Defiance, Onio.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochane & Company. Kitchener. Ont.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie. H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

LEATHER (Artificial)
Fibro Mfg. Company, Beverly, N. J.

LEATHER CLOTH
Zapon Leather Cloth Co., New York.

LUMBER MEASURER
Durant Mfg. Co. Milwaukee, Wis.

MACHINE KNIVES
Atkins & Co., E. C., Indianapolis, Ind.
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Peter Hay Knife Company, Galt, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont

MIRRORS
Chicago Mirror & Art Glass Co., Chicago, Ill.
Hart Mirror Plate Co., Grand Rapids, Mich.

MITRE SAWS
Atkins & Co., E. C., Indianapolis, Ind.
Canada Machinery Corporation. Galt, Ont.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.

MOTOR TRUCK EXTENSIONS
Swedish Crucible Steel Co., Windsor, Ont.

MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A. Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

NAILS
Laidlaw Bale-Tie Co., Hamilton, Ont.

NAILING MACHINES
Morgan Machine Co., Rochester, N.Y.

OIL
Zero Oil Co., Parkersburg, Pa.

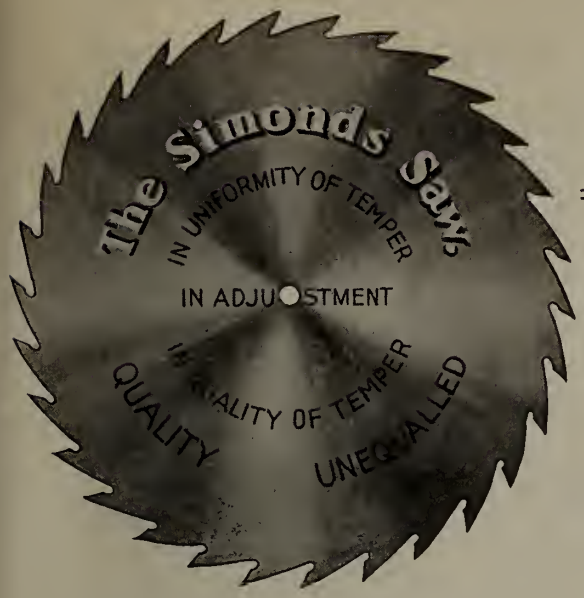
OIL STONE GRINDERS
Mummert-Dixon Co., Hanover, Pa.

PANELS
Algoma Panel Co., Algoma, Wis.
Gorham Bros., Mount Pleasant, Mich.
Hardwood Products Co., Nennah, Wis.
Hay & Co., Woodstock, Ont.
Holden Company, Henry S., Chicago, Ill.
Roberts, Geo. G., Chicago, Ill.
Waetjin & Co., L., Milwaukee, Wis.

PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Wallace & Co., J. D., Chicago. Ill.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PERIOD MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich

PERIOD TURNINGS
Decorators Supply Co., Chicago, Ill.



SIMONDS
CIRCULAR AND BAND
SAWS

In every mill or woodworking shop in the land the demand for greater production is urgent. Devious methods to secure the desired results are being tried out. Some are making good—some are not. They have the manpower, but they can't get production. Many mills and woodworking shops have discovered one of the greatest hindrances to efficient operation are poor saws and knives. The saws dull easily and do not hold their tension, while the knives lose their cutting-edge quickly and this results in unsightly marks on the lumber, and consequently damage.

Inferior saws and knives are being discarded by many, and in most cases Simonds Products are replacing them. There is no question about Simonds Saws and Knives. They are made of the finest steel obtainable, hardened and tempered right and make mechanically perfect. They produce smooth lumber and cut down your operating expense.

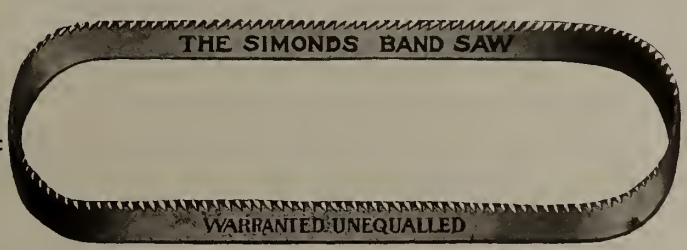
Write for catalog and prices.

Simonds Canada Saw Co., Limited

"The Saw Makers"

MONTREAL, Que.

VANCOUVER, B.C. ST. JOHN, N.B.



"Canadian Woodworker" Buyers' Directory—Continued

PLANERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Colladay Machine Works, Indianapolis, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLANING MILL MACHINERY
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PRESSES (Veneer)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Jackson, Cochrane & Company, Kitchener, Ont.
Perrin & Co., Wm. R., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

REED
Carter & Co., E. T., Toronto, Ont.
Overseas Reed and Cane Co., Ionia, Mich.

REED MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

RESAWS
Atkins & Co., E. C., Indianapolis, Ind.
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

RIM AND FELLOE MACHINERY
Defiance Machine Works, Defiance, Ohio.
Fay & Egan Co., J. A. Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mackenzie Machinery Co., D., Guelph, Ont.
Mattison Machine Works, Rockford, Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

ROSETTES
Waddell Mfg. Co., Grand Rapids, Mich.

RUBBING MACHINES
DeVilbiss Mfg. Co., Toledo, Ohio.
Mattison Machine Works, Rockford, Ill.

SAFETY DEVICES
Cowan & Company, Galt, Ont.

SANDERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Loeffler Machine Co., Wm., Sheboygan, Wis.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SASH, DOOR & BLIND MACHINERY
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SAWS
Atkins & Co., E. C., Indianapolis, Ind.
Disston & Sons, Henry, Toronto, Ont.
Radcliff Saw Mfg. Company, Toronto, Ont.
Seibert & Co., Louis, Cincinnati, Ohio.
Shurly-Dietrich, Ltd., Galt, Ont
Simonds Canada Saw Co., Montreal, Que.
Wallace & Co., J. D., Chicago, Ill.

SAW BENCH
Wallace & Co., J. D., Chicago, Ill.

SAW SHARPENERS
Hooker & Son, O. V., St. Johnsbury, Vt.

SAW SWAGES
Atkins & Co., E. C., Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Crowel, D. J., Buffalo, N. Y.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Radcliff Saw Mfg. Co., Toronto, Ont.

SAW TABLES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Wallace & Co., J. D., Chicago, Ill.
Yates Machine Co., P. B., Hamilton, Ont.

SCRAPING MACHINES
Canada Machinery Corporation, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Whitney & Sons, Baxter D., Winchendon, Mass.

SCREW DRIVING MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.
Reynolds Machine Co., Massillon Ohio.

SCROLL SAWS
Atkins & Co., E. C., Indianapolis, Ind.
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Jackson, Cochrane, & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamiltonfi Ont.

SECOND-HAND MACHINERY
Casey, M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Osborne Sexton Machinery Co., Columbus, O.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

SHAPERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Sons, Baxter D., Winchendon, Mass
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SHAVING COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

STAINS
Ault & Wiborg, Toronto, Ont.
Williams Bros. & Co., Hounslow, Eng.

SINGLE SPINDLE BOXING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

STAVE SAWS
Atkins & Co., E. C., Indianapolis, Ind.

STAVE SAWING MACHINE
Whitney & Son, Baxter D., Winchendon, Mass

STEEL DOOR MATS
Cary Mfg. Company, Brooklyn, N.Y.

SURFACERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Yates Machine Co., P. B., Hamilton, Ont.

SWING SAWS
Atkins & Co., E. C., Indianapolis, Ind.
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Eaglesfield, R. D., Indianapolis, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE LEG LATHES
Fay & Egan Co., J. A., Cincinnati, Ohoa.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE SLIDES
Jefferson Woodworking Co., Louisville, Ky.
Walter & Company, B., Wabash, Ind.

TEMPERATURE REGULATORS
Canadian Powers Regulator Co., Toronto, Ont.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Compan, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TIME CLOCKS
International Business Machines Co., Toronto, Ont.

TOPS
Gorham Bros., Mount Pleasant, Mich.

TRIMMERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Preston Woodworking Machinery Company, Pretson, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TRUCKS
Cowan Truck Company, Toronto, Ont.
National Dry Kiln Co., Indianapolis, Ind.

TURNED WOOD GOODS
Algoma Wood Products Co., Algoma, Wis
Canada Wood Specialty Co., Orillia, Ont.

TWINES & WEBBING
Doon Twines, Ltd., Kitchener, Ont.

MORGAN
NAILING MACHINES

Are built strongly for heavy continuous service. Machines adapted to all kinds of special nailing.

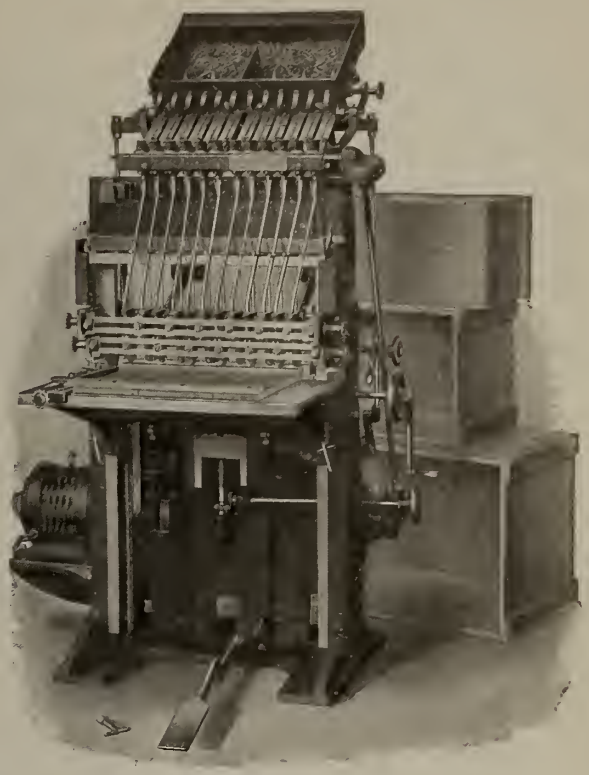
Regular machines for all sizes of boxes and crates.

Write us for descriptive literature.

Machines that save money

Morgan Machine Co.

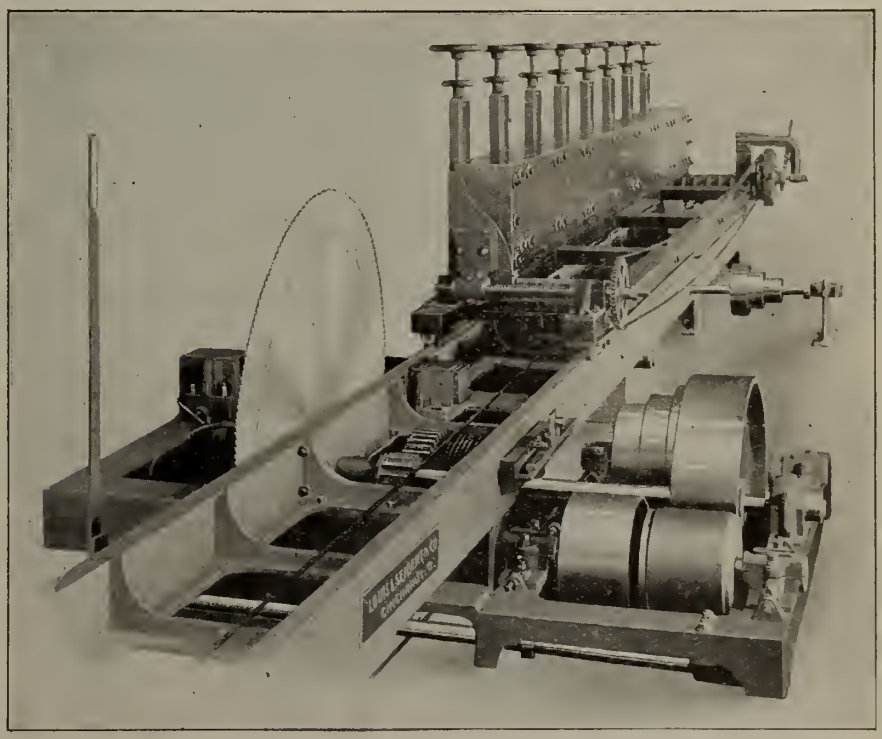
DEPT. A ROCHESTER, N.Y.



Morgan No. 12-30 Open Back Nailing Machine, Fitted with motor.

Veneer
and
Thin Lumber Saws

POSITIVE
AUTOMATIC
SET WORKS
AND
OFFSET



"A Mill Backed by Thirty Years' Progressive Experience."

Louis L. Seibert & Company, CINCINNATI, OHIO

"Canadian Woodworker" Buyers' Directory—Continued

VARNISHES
Adams & Elting Co., Chicago and Toronto.
Ault & Wiborg Company, Toronto. Ont.
Penfound Varnish Co., Toronto, Ont.

VARNISH DRYERS
Nicholls Co., A. S., New York, N.Y.

VARNISH SPRAYERS
DeVilbiss Mfg. Co., Toledo, Ohio.
Paasche Air Brush Company, Chicago, Ill.

VENEERS
Batesville Lumber & Veneer Co., Lawrenceburg, Ind.
Birds Eye Veneer Co., Escanaba, Mich.
Bury & Compny, Robert, Toronto, Ont.
Central Lumber Co., Indianapolis, Ind.
Christmann Veneer & Lumber Co., St. Louis, Mo.
Curtis Co., C. E., Chicago
Dean Spicker Company, Chicago, Ill.
Empire Veneer Company, Chicago, Ill.
Evansville Veneer Co., Evansville, Ind.
Freiberg Lumber Co., Cincinnati, Ohio
Frye Lumber & Veneer Co., J. W., Dayton, O.
Guelph Patent Cask Co., Scotstown, Que.
Hartzell, Geo. W., Piqua, Ohio.
Hoffman Bros. Company, Fort Wayne, Ind.
Holden, Henry S., Chicago, Ill.
Hardwood Prudocts Co., Neenah, Wis.
Korn-Conkling Co., Memphis, Tenn.
Long-Knight Lumber Co., Indianapolis, Ind.
Litton Veneer Co., Rockford, Ill.
Memphis Veneer & Lumber Co., Memphis, Tenn.
Mowhawk Veneer Co., Warren, Pa.
Munising Woodenware Co., Munising, Mich.
National Veneer & Lumber Co., Indianapolis, Ind.
North Vernon Lumber Co., North Vernon, Ind.
Northwestern Cooperage & Lumber Co., Gladstone, Mich.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod-Jurden Co., Memphis, Tenn.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Veneer Co., New Albany, Ind.
Roberts, Geo. G., Chicago, Ill.
Southern Veneer Mfg. Co., Louisville, Ky.
Stimson Veneer & Lumber Co., Memphis, Tenn.
Talge Mahogany Co., Indianapolis, Ind.
Thompson & Co., Lewis, Philadelphia, Pa.
Toronto Veneer Company, Toronto, Ont.
Veneer Manufacturers Co., Chicago, Ill.
Waetjen & Co., George L., Milwaukee, Wis.
The Williamson Veneer Company, Mills—Baltimore, Md. Sales Branches, New York, N. Y., Chicago, Ill., Jamestown, N.Y., High Point. N.C.
Warren Ross Lumber Co., Jamestown, N. Y.
Wood Mosaic Co., Louisville, Ky.

VENEER SAWS
Atkins & Co., E. C., Indianapolis, Ind.

VENEER TAPE
Canadian Nashua Paper Co., Peterboro, Ont.
Gummed Products Co., Troy, Ohio.
Ideal Coated Paper Co., Brookfield, Mass.

VENTILATING APPARATUS
Canadian Blower & Forge Co., Kitchener, Ont.
Neville-Cooper Co., Toronto.

VENEER JOINTERS
Garlock-Walker Machinery Co., Toronto, Ont.

VENEER MACHINERY
Garlock-Walker Machinery Co., Toronto. Ont.
St. Joseph Iron Works, St. Joseph, Mich.

VENEER PRESSES (Hand and Power)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Perrin & Company, Wm. R., Toronto, Ont.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.

WALNUT LUMBER
American Walnut Mfrs. Assn., Chicago.
Frye Lumber & Veneer Co., J. W., Dayton, Ohio.
Pickrel Walnut Company, St. Louis.
Porter, Frank R. Washington, D.C.
Purcell Walnut Lumber Co., Frank, Kansas City.

WINDOW FRAME MACHINE
Atlas Mfg. Co., Orlando, Florida.

WIRE
Laidlaw Bale-Tie Co., Hamilton, Ont.

WIRE BOX STRAPPING
Cary Mfg. Company, Brooklyn, N.Y.

WOOD FINISHES
Adams & Elting Co., Chicago and Toronto.
Ault & Wiborg, Toronto, Ont.
Penfound Varnish Co., Toronto, Ont.

WOODWORKING MACHINERY
General Machinery Co., Toronto, Ont.
Ober Mfg. Co., Chagrin Falls, Ohio.

WOOD STAINS
Williams Brothers & Co

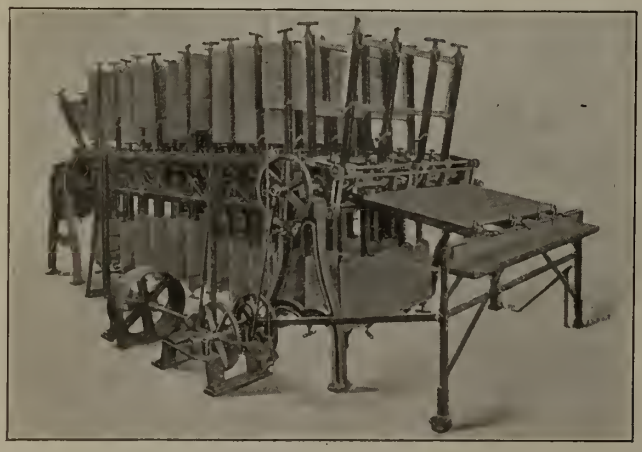
WOOD TURNING MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Yates Machine Co., P. B., Hamilton, Ont.

WORK BENCHES
Fay & Egan Co., J. A., Cincinnati, Ohio.

WOOD LATHES
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOODWORKING SPECIALTIES
Brantford Pattern Works, Brantford, Ont.

One Man Does the Work of Two
with a Billstrom Glue Clamp Carrier

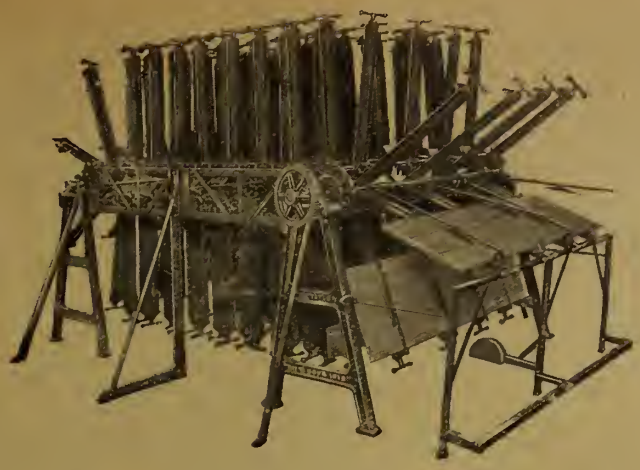


For every plant where much edge-gluing is done there is a real need for a Billstrom.
Here's why:—

The empty clamp is held at just the right height for the greatest convenience of the workman.
When the clamp is filled he pulls a cord, which carries the filled clamp away and deposits an empty one in its place.
One man can accomplish as much by using it as two men can do employing the old methods.
It holds the work off the floor until the glue has set, when the glued stock can be quickly removed and piled flat, thus greatly conserving space.
It reduces the labor and cost of edge gluing to the minimum.
There is a sizs to suit your particular requirements.

N. J. BILLSTROM
2002 NINTH ST. ROCKFORD, ILL.

The Taylor TRADE MARK



The Taylor TRADE MARK

Clamp Carrier

Largest Capacity
Smallest Floor Space

Quickest Acting
Most Powerful Clamp Known

One user writes:—"Additional equipment has so speeded up our Jointing Department as to necessitate the installation of a TAYLOR CLAMP CARRIER."

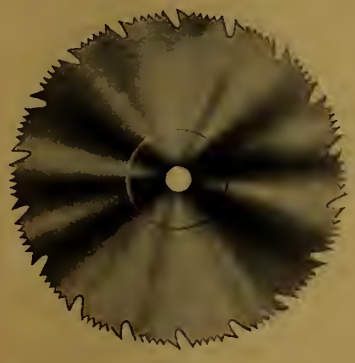
A. R. WILLIAMS MACHINERY CO., Toronto, Canada—Representatives

James L. Taylor Manufacturing Co.
POUGHKEEPSIE, N. Y.

ATKINS

STERLING QUALITY

SAWS and KNIVES



The best steel—the most careful and accurate workmanship—the equipment that will eventually save you money.

Atkins Sterling Quality Saws and Knives are proving their superiority by competitive tests in the largest plants of the country. We welcome your most careful investigation, as we know the satisfaction that will result.

Write to-day for our Knife Booklet "C W" and Pattern Template Paper.

E. C. ATKINS & CO.

Makers of Sterling Saws

Factory—HAMILTON, Ont. **Vancouver Branch—109 Powell Street**

"176" in factory of Western Furniture Company, Indianapolis, sanding inside curved edge of a circular cabinet panel against solid sanding roll. The curved frames on the trucks are similarly finished at a very considerable saving over other methods.

MATTISON

176

Oscillating Belt Sander

For Edge and Shaped Work

Successfully employs stationary forms

This shows a narrow-nosed form which provides an accurate and economical method for sanding the curved and flat members of both square and octagonal pieces. The sanding is done with the grain, and the stock is handled but once.

BECAUSE of its substantial construction, this sander is entirely free from vibration, making the use of special forms completely successful.

This feature provides a superior method for sanding the small, flat curves of ornamental square or octagon legs, pilasters, etc. The work is accomplished quickly, accurately and economically. Oscillation of the sandbelt improves quality by eliminating scratch marks.

Such a large variety of flat and curved edge work can be completely finished on this Oscillating Belt Sander, that no furniture factory can afford to do without it.

Send for Illustrated Bulletin Describing this Method in Detail

MATTISON MACHINE WORKS

Rockford, Illinois, U. S. A.

Volume Twenty-One TORONTO, JULY, 1921 Number Seven

CANADIAN WOODWORKER and Furniture Manufacturer

C.M.C.

No. 433 Hand Block Belt Sander

In these days when high quality and low cost of production are essential, a Sander of this type is a necessity in most woodworking shops. It is simple to operate, will work all classes of regular and irregular stock, save time and produce a high quality finish.

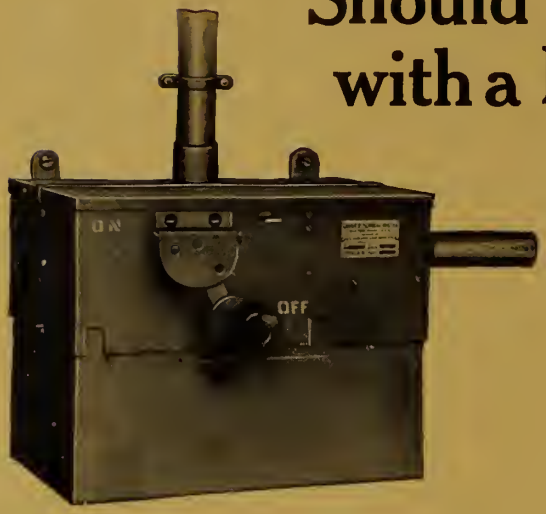
Let us send you further particulars.

CANADA MACHINERY CORPORATION, GALT, ONTARIO
LIMITED

Toronto Sales Office - - 721-2 Bank of Hamilton Building.

CONDIT

No Power Circuit Should be Broken with a Knife Switch



Condit Type N-2 Oil Switch

Condit Type 1 Oil Starter

By using Condit Oil Starters and small industrial Oil Switches to protect small motors and small power and lighting circuits in woodworking plants, the fire hazard is eliminated and many delays caused by trouble with small motors not properly protected, is avoided. When a circuit is opened, the arc is under oil which immediately extinguishes it. Thus, serious trouble very often caused by knife switch blades burning in ways which prevent proper contact and allowing a three phase motor to operate on single phase, is obviated.

Our Nearest House can Supply You

Northern Electric Company
LIMITED

Montreal Halifax Quebec Ottawa Hamilton
Toronto London Windsor Winnipeg
Regina Calgary Edmonton
Vancouver

CONDIT: *the Synonym of Safety in Electrical Protective Equipment*

Busines is Picking up-Are You?

There is Good Picking Here

These machines are priced to sell under present conditions. All in our Dufferin Street Warehouse, subject to your inspection. We have many others. Let us know your requirements

1—McGregor-Gourlay Double Arbor Universal Saw Table, same as C.M.C. No. 618, with 14″ saws, self-contained countershaft, full complement of gauges, saws, wrenches, etc.

1—Preston No. 127 Variety Saw Table, countershaft attached, one 14″ saw.

1—Ballantine 36″ Band Saw, with solid lower wheel, complete with saw blades, wrenches, etc.

1—Ballantine Two Spindle Shaper, Spindles 20½″ centres, diameter of spindles where collars go on 1⅛″, top 42″ x 42″.

1—American No. 1 Single Spindle Shaper. Fig. 937 with plain countershaft.

1—C. M. C. No. 507 Mortiser, with boring attachment.

1—C.M.C. No. 624 Hand Feed Rip Saw Machine, with self-contained counter shaft, table 6′6″ long by 40″ wide, with plain box gauge, 22″ saw blades, 1¼″ arbor with cone for receiving saws different diameter.

1—Ballantine 8″ Four Sided Moulder, complete with square heads and straight knives on all heads.

1—American No. 2½ Single End Tenoner, with two copes and cut-off saw attachment. Fig. 9431 in American Woodworking Machinery Catalog.

1—C.M.C. No. 646 Roller Table Cut-off Saw, sliding table 7′6″ long, stationary table 50″ to the saw, sliding table equipped with stop gauge, including five stops, with countershaft, complete with saws, wrenches , etc.

1—Cowan Combination Vertical and Horizontal Boring Machine, complete with wrenches, etc.

1—Hespeler 12″ Buzz Planer, fitted with round cylinder, full set of knives, countershaft, wrenches, guard, etc.

1—Preston 36″ Band saw, lower web wheel and guards.

8—Sections Cowan Four Screw Veneer Press 12″x50″, four sections 27″ clear space under screw plates, four sections 32″ under screw plates.

1—24″ Francis Double Roll Glue Spreader.

4—Sections Cowan Three Screw Veneer Press 38″x12″, 28″ clear space under screw plates.

1—C.M.C. Arm Sander, No. 438, with paper cutter.

1—Universal Knife Grinder, 37″, made by American Wood Working Machinery Co., Fig. 1126 in their catalogue.

1—60″ Sturtevant Single Slow Speed Exhauster, left hand, top vertical discharge, complete with platform and rods to suspend from ceiling.

1—Cowan Chain Mortiser with grinder.

1—Ballantine 36″ Band Saw, lower web wheel.

1—American No. 3 Double Cut-Off Saw, new machine, capacity from 8″ to 6′ 9″ in length, 4″ thick and 30″ wide.

1—American No. 25 Edging and Ripping Saw, new machine.

1—American No. 30 Double Arbor Universal Saw Bench, new machine.

1—Preston 24″ No. 121 Pony Planer, used only couple of months.

1—McGregor-Gourlay 24″ Pony Planer.

1—Mershon Band Rip Saw.

SPECIALS

1—Morgan Two-Arm Shock Fastener, used machine, but in firstclass condition.
1—Used Morgan Eight-roll Box Board Matcher.
1—Used Morgan 12-spindle Double Row Chucks, Open Back Nailing Machine.

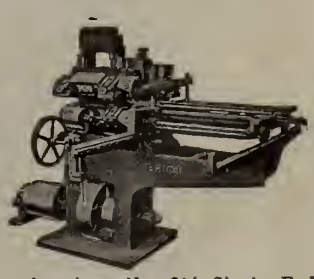
American No. 25 Power Feed Edging and Ripping Saw

Garlock-Walker Machinery Co., Limited

32 Front Street West

WINNIPEG TORONTO MONTREAL

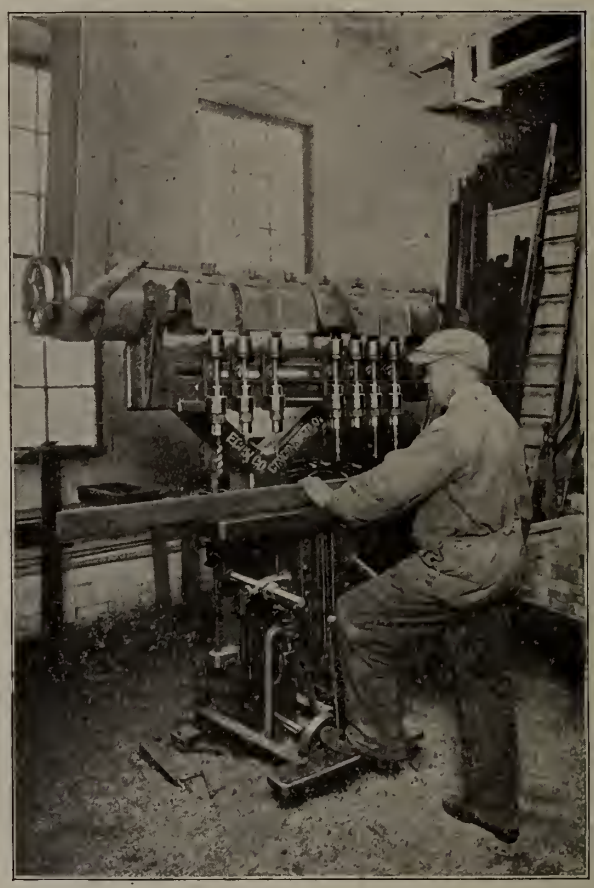
Everything in Woodworking and Metal Working Machinery



American No. 2½ Single End Tenoning Machine

Do Your Boring in Multiple!

One man with a No. 312 can do more work and do it more accurately than three men can do on single spindle machines.



"The Lightning" Line
TRADE MARK REG.

No. 312 "Lightning" Multiple Spindle Borer

No. 312 will bore any number of holes of the same or different size in a straight line or staggered, in the time usually taken to mark off and bore one hole—every piece an exact duplicate.

The boring is handled very rapidly as the table raises and lowers continuously.

Write for full particulars about this wonderful machine.

J. A. Fay & Egan Company

ESTABLISHED 1830

World's Oldest and Largest Manufacturers of Woodworking Machinery

153-173 West Front Street, Cincinnati, Ohio

EXTREMELY WELL PLEASED

That's what you would say if you had a Yates 431 Endless Bed Sander in your plant. A customer wrote us who is considering installing another 431 and said:

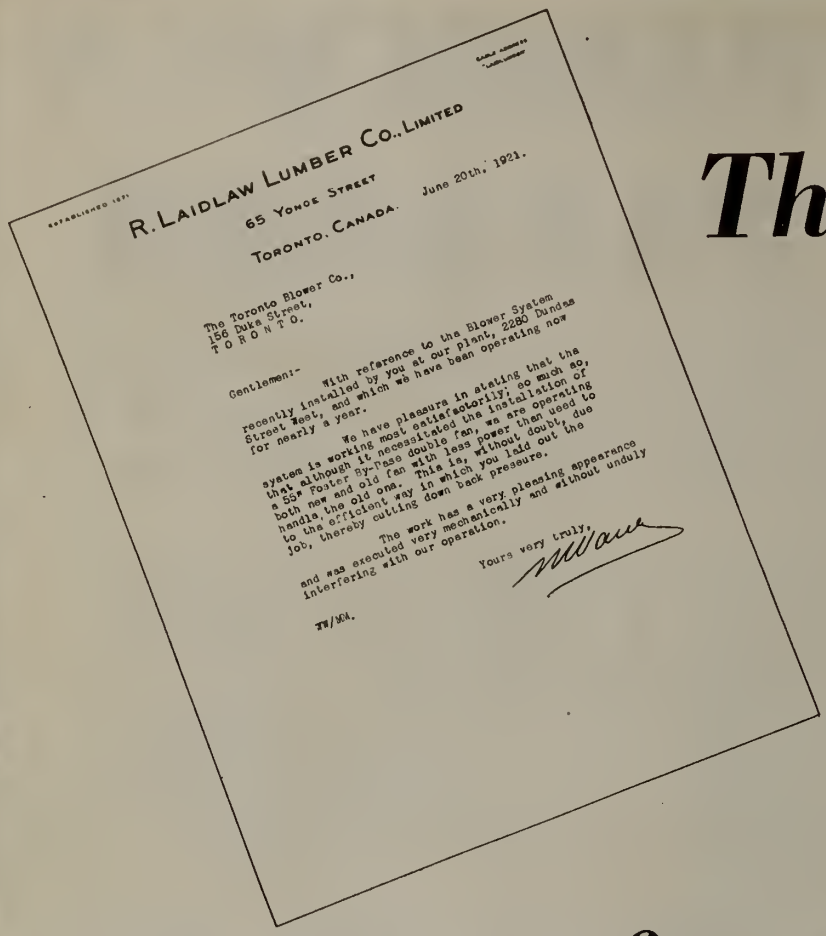
"We have been extremely well pleased with the service which your 431 Sander has given us. As a matter of fact, it has been so thoroughly satisfactory that we are not considering, on this proposition, any other machine than your own."

What better recommendation could you want?

Our new 60-page Sander Book, fully illustrated, with a fund of information on sanding, is just completed. Get a copy.

P. B. Yates Machine Co. Ltd.

Hamilton - Canada



R. LAIDLAW LUMBER CO., LIMITED
65 YONGE STREET
TORONTO, CANADA. June 20th, 1921.

The Toronto Blower Co.,
156 Duke Street,
T O R O N T O.

Gentlemen-

With reference to the Blower System recently installed by you at our plant, 2280 Dundas Street West, and which we have been operating now for nearly a year.

We have pleasure in stating that the system is working most satisfactorily; so much so, that although it necessitated the installation of a 55r Foster By-Pass double fan, we are operating both new and old fan with less power than used to handle the old one. This is, without doubt, due to the efficient way in which you laid out the job, thereby cutting down back pressure.

The work has a very pleasing appearance and was executed very mechanically and without unduly interfering with our operation.

Yours very truly,

The Proof -- of the Pudding

This plant is described on Page 81 of March Issue of The Canadian Woodworker & Furniture Manufaeturer.

We are Specialists

We design, install and guarantee our systems from the making of the fan right down to the finest detail of installation.

Heavy Sheet Iron Work a Specialty

Toronto Blower Company
156 Duke Srteet - - - - - Toronto

IT'S JUST LIKE THROWING MONEY AWAY

To Use an Inefficient and Unreliable BELT

STOP IT!

You Can SAVE MONEY By Using

D. K. McLaren's Genuine British OAK TANNED Leather Belting

SOMETIMES you hear a man complain that belting is expensive. Investigate and you will invariably find that he has never used a really worthwhile belt—his has been of the cheaper grade, continually stretching, breaking, losing power and causing frequent break-downs.

Belting of that type is, and always will be expensive. Belting costs cannot be figured by the price-tag, but by the ultimate service the belt will render.

Fortunately, most woodworkers know the truth of this so that good belting is the rule and not the exception in the average plant. And it is a significant fact that with the busiest and most progressive of these, D. K. McLAREN'S GENUINE BRITISH OAK TANNED BELTING is the kind used. Our organization is at the service of belting users everywhere to advise them in the selection of the right belt. Can we be of service to you?

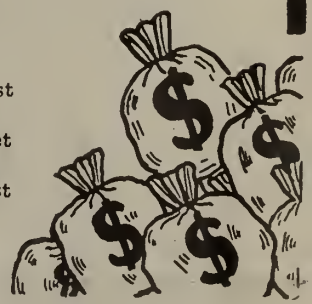
D·K·McLAREN LIMITED

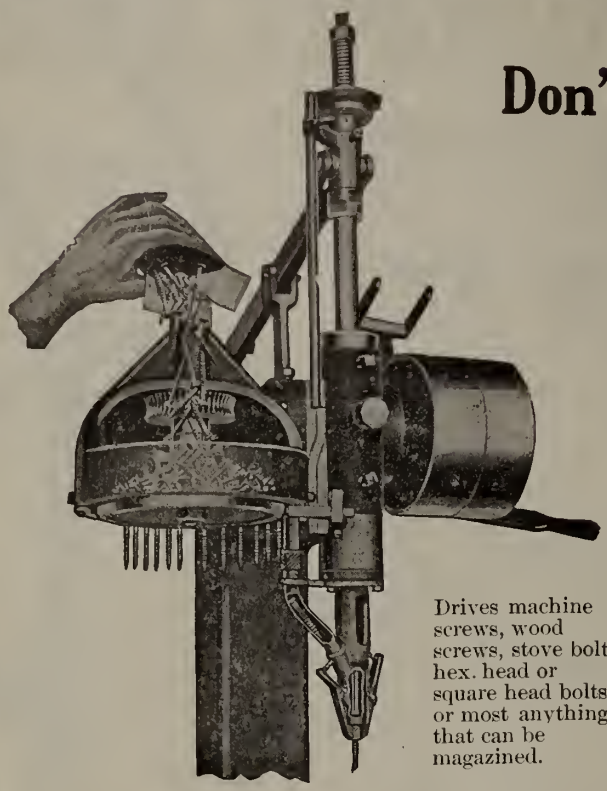
Head Office and Factory:
351 St. James Street
Montreal, P.Q., Canada

TORONTO, ONT.
194 King St. West

ST. JOHN, N.B.
80 Germain Street

VANCOUVER, B.C.
334 Cordova West





Drives machine screws, wood screws, stove bolts, hex. head or square head bolts, or most anything that can be magazined.

Don't waste time and money driving screws by hand

Follow the example of your competitors and install Magazine Fed Screw Driving Machines

The Reynolds Machine Co.
Department C.
Massillon, Ohio, U. S. A.

Robertson Patented Socket Head Wood Screws

Take the *high costs* out of Screw - driving

No matter whether you use automatic screw-driving machines or the hand method, you will find them far superior to work with.
Note the patented recess head as shown in the illustration. When the driver is set in it there is no chance of it slipping out and all burring is eliminated. The result is a clean, neat-appearing job that adds to the value of your product.

Many manufacturers are now using them exclusively and are all delighted with the results. **Drivers supplied free with first orders, and include** hand drivers, Yankee bits, brace bits or bits for the Reynolds machine, which gives exceptional efficiency when using recessed head screws. Send post card for free samples with bits which will prove our contention of double efficiency and savings in time, labor and annoyance, worth more to a large screw user than his entire outlay in buying screws.

P. L. Robertson Mfg. Co., Ltd.

Milton - - - Ontario

A few of the

EXCEPTIONAL BARGAINS

appearing in our regular Monthly Woodworking Machinery List, are as follows:—

If It's Machinery—Write "WILLIAMS"

No. 51252	7½' Taylor Clamp Carrier, 40 sections, 160 clamps. Practically new.
42325	Baker Bros. Dowel Machine, 2½", used.
50577	No. 155 Jackson Cochrane Band Rip and Edging Saw, used
51162	36" Preston Band Saw, new.
51129	42" McGregor Gourlay Band Rip Saw, used.
50944	Preston High Speed Ballbearing Shaper, slightly used.
42671	Cowan, M. 93, 2 Spindle Shaper, Iron Table, 42" square, spindles 1" dia. 20" centres, new.
51131	C.M.C. 12" Jointer with round safety cylinder, new.
48850	42" Berlin Invincible 3 Drum Sander, used.
42780	Beach Disc and Drum Sander, new.
48845	New Britain Chain Mortiser, used.
71717	No. 312 Morgan Box Trimming Machine, used.
50659	No. 10 Morgan Nailing Machine, with double row of chucks and clinching device, used.
48629	Meeren-Johnson Boxboard Squeezer, used.
51140	No. 10 Ober Lathe, for turning handles, 1-11/16", new.
51165	No. 4 Waymoth Lathe, with sizing rings, used.
43906	Preston Manual Training Lathe, with motor drive, new.
51176	Yates No. 108 10", 4-side Moulder, used.
50781	Cowan Door Sticker, used
48143	S. A. Woods, 15" x 6 Inside Moulder, used.
51181	Yates 2-G Straight Edge Ripper. with revolving bed, 10" saw, used.
50735	Wood Frame Rip Saw Table, used.
50736	Cowan, No. 208, Boxmaker Rip Saw, used.

Our Monthly List is the largest and most comprehensive list of first-class Woodworking Machinery issued.

THE PRICES ARE RIGHT

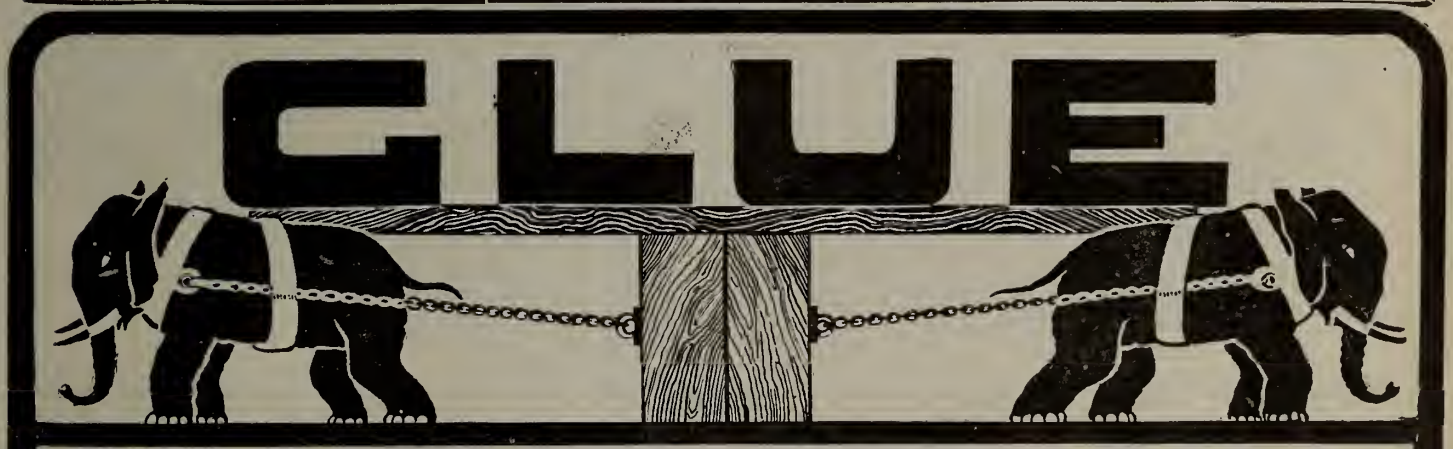
The A. R. Williams Machinery Co., Limited

64 FRONT ST. WEST - TORONTO

Phone Woodworking Machinery Dept., Adelaide 20

Full lines of Iron and Wood-Working Machinery, Boilers, Engines and Contractors' Machinery, Electric Motors, Saws, Shingle and Lath Mill Machinery, etc

HALIFAX, N.S. ST. JOHN, N.B. MONTREAL, P.Q. TORONTO, ONT.
VANCOUVER, B.C. WINNIPEG, MAN.



FOR THE FINEST CABINET WORK AND VENEERING.

Suitable for All Climates.
Great Strength & Light Colour.

SAMPSON & WHITE, Ltd.

6, HOLBORN VIADUCT, LONDON, E.C.

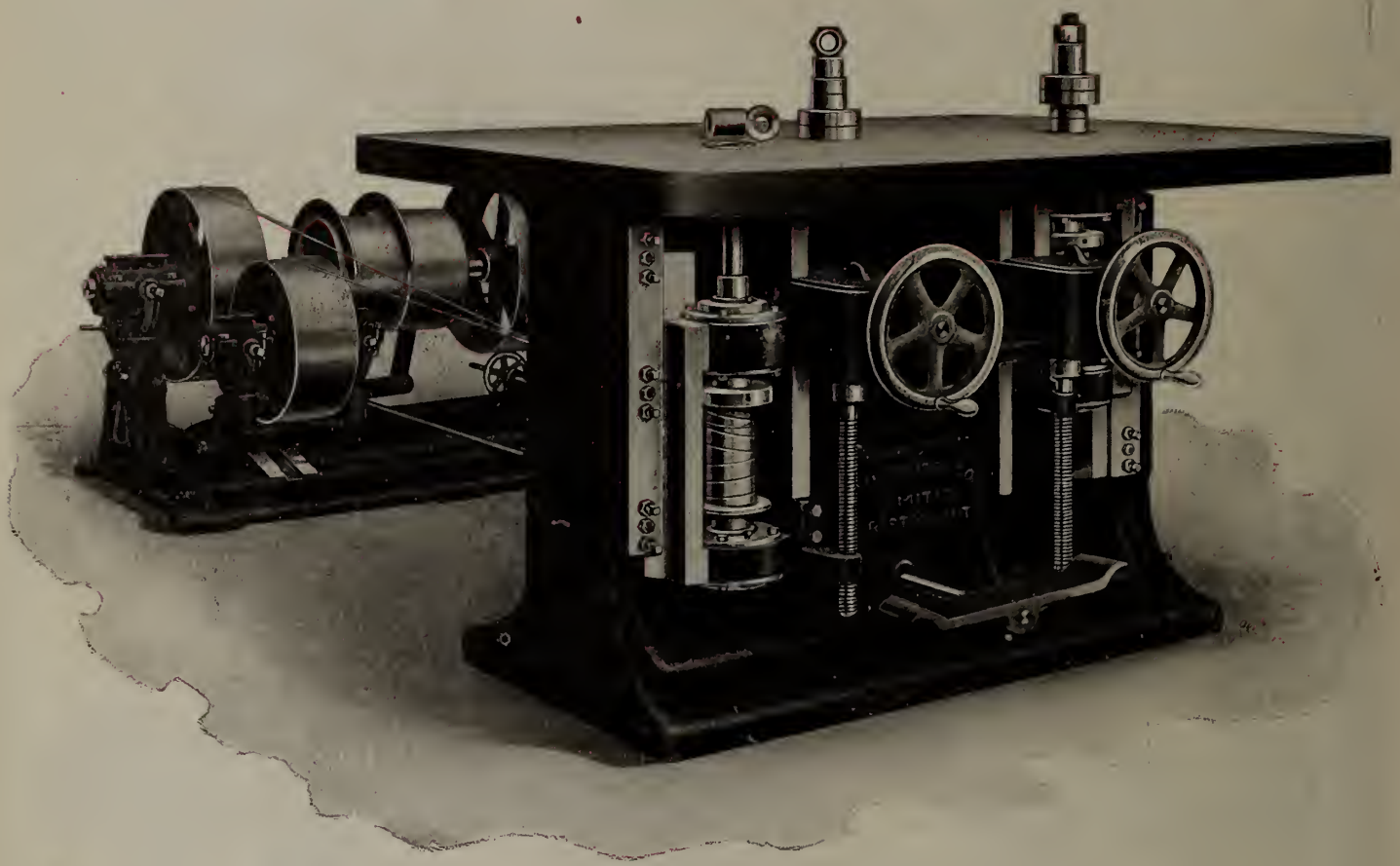
You can Double your Shaper Output

with one of our No. 162

HEAVY HIGH-SPEED BALL-BEARING SHAPERS

and you can also

Improve the Quality of your Work



May we have a chance to prove this strong statement to you when you need a Shaper?

We have specialized In Ball Bearing Shapers for twelve years and offer you a machine having every known and modern improvement. We will gladly furnish you with the names of a hundred users as proof of our claims.

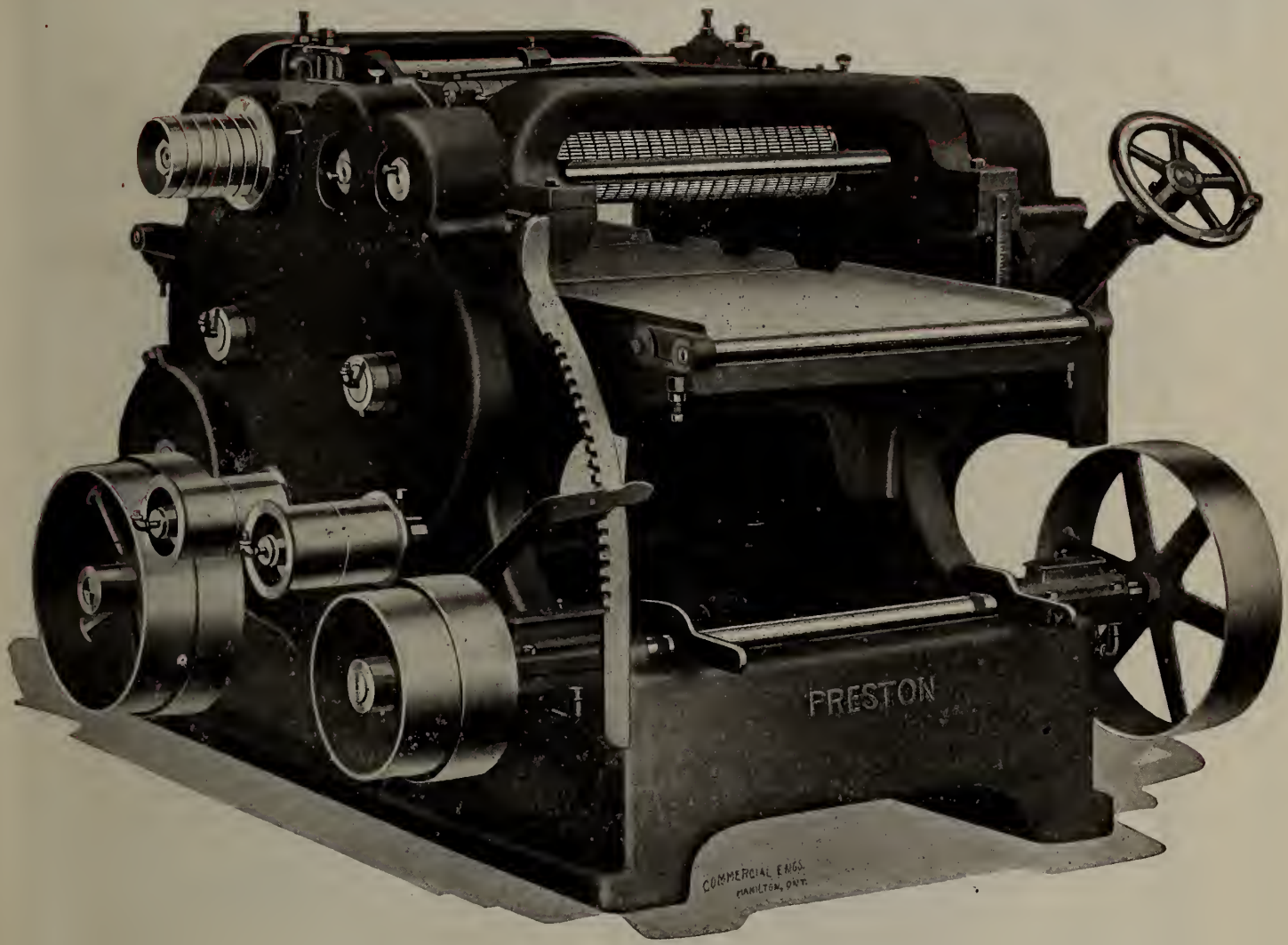
PREDOMINANT FEATURES—Spindle speeds, 7,000 to 12,000 r. p. m. Specially selected S. K. F. Ball Bearings. Weight, 2,750 pounds. Built with either one or two spindles.

The Preston Woodworking

PRESTON,

Premier Manufacturers of Ball Bearing Shapers in Canada

Introducing a New High Speed Ball Bearing Surface Planer



(1) Specially selected S. K. F. Ball Bearings
(2) Sectional Roll and Sectional Clipbreaker
(3) Round Cylinder with 4 High Speed Knives
(4) Stockbridge Knife Grinder and Jointer
(5) Cylinder Speed, 5000 r. p. m.

The above is a cut of our No. 123--30 in. single surface planer recently shipped a customer. We have supplied a number of them within the last two years, equipped exactly as above, and would gladly show you the machines in operation in the different plants where sold.

Machinery Company, Ltd.
ONTARIO

We are the Sole Manufacturers and Agents in Canada of the Eaglesfield Patented Beltless Swing Saw—See advertisement page 12.

Eaglesfield "BELTLESS" SWING SAW

Announcing——

A new design with special high-torque small-diameter

MOTOR DIRECT ON ARBOR

In addition to the present type of EAGLESFIELD BELTLESS SWING SAW, motor gear-connected, which was put on the market in 1919, we now announce a new design, with motor mounted directly on 2-in. spindle—gears entirely eliminated.

With ample power for saws up to 24-in., this new design permits a range of cutting from the small shop requirements up to heavy-duty service in car shops and saw mills.

Motor connection takes up only 3½ in. of saw, leaving ample clearance—as on a 24-in. saw, 8¼-in. cutting surface is available. Saw can be trammed for more accurate cutting than you have been accustomed to.

The unified hanger construction, resilient spring action, and the 7-in. section column are identical with the gear-head machine.

Motor is of the enclosed, built-in type, 25 or 60-cycle, 2 or 3 phase, any voltage. Extra large size S K F ball bearings. Saw up to 24-in. included in equipment.

Made in Canada

Preston Woodworking Machinery Co.
PRESTON - ONTARIO

R. D. EAGLESFIELD
22nd St. and Northwestern Ave. INDIANAPOLIS, IND.

Have You a Circular of the Eaglesfield "BELTLESS" TILTING ARBOR SAW

"Every board you use has to be cut off"

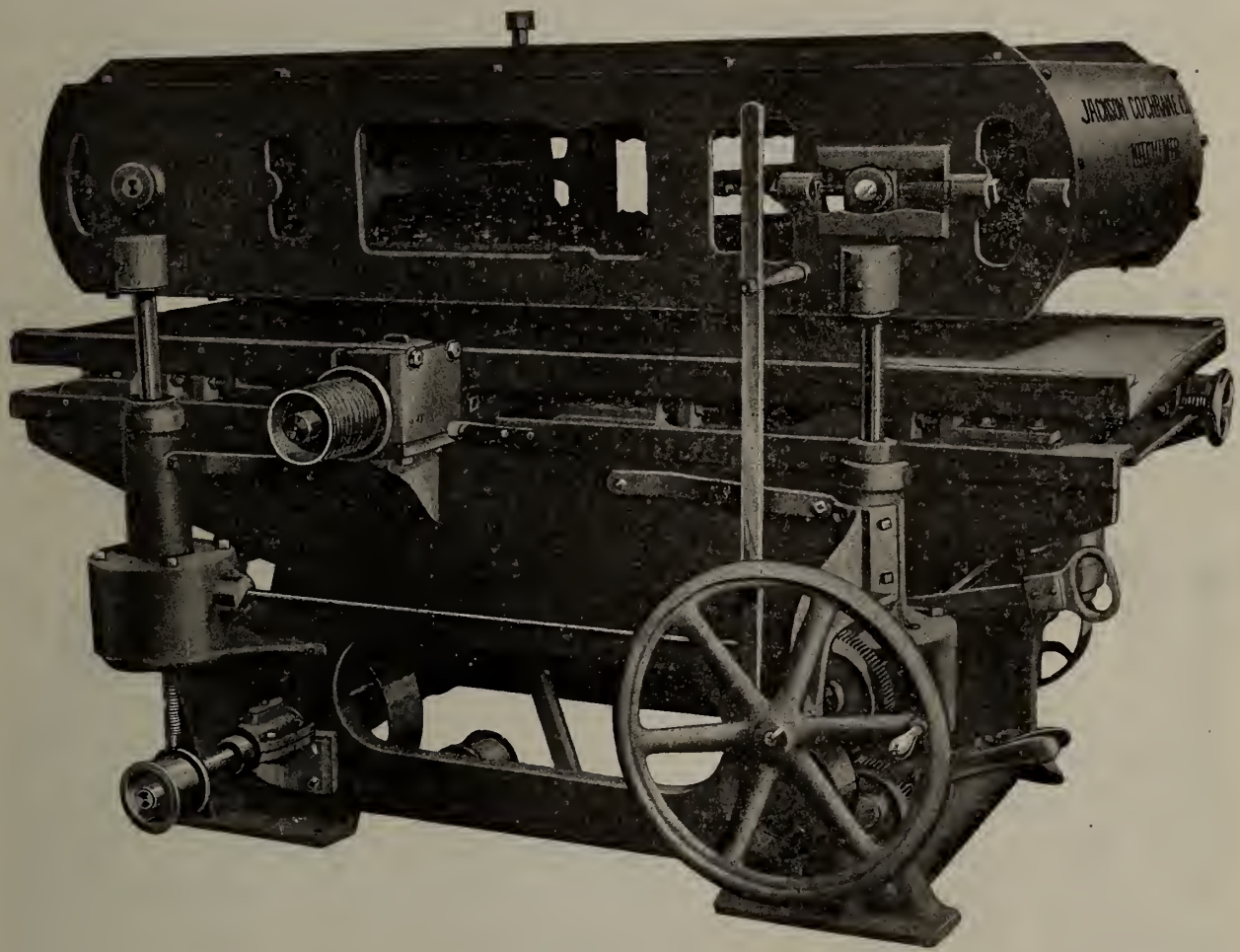
The

Herzog Self-Feed Jointer

means

Increased Production **Simplicity of Operation**
Small Floor Space **Safety to Employees**

Does four times the work of the Hand Jointer



Our No. 34 Herzog Jointer, illustrated above, is one of the most efficient machines on the market to-day. It is appreciated by the manufacturer and employees alike, because, while it will produce from three to five times as much work as the hand jointer, it does not require skilled operators, but eliminates the danger so common to other makes. It can be operated by two boys. It will handle stock varying in width from 1 inch to the full width of the jointer, will feed fast or slow, takes only one-fourth the floor space of hand jointers, and requires only one-fifth of the sharpening of the knives. It is fitted with power feed raising and lowering attachment, with cylinder double belted and driven from both ends.

If interested in reducing your costs, write us

Jackson, Cochrane & Company

KITCHENER - CANADA

The Shimer Round Safety Cylinder with High Speed Knives

A Round Safety Cylinder that will Appeal to the Buyer and the User for three Reasons:

The first is our adjusting nut for setting the knives. It is the only cylinder with properly located adjusting nuts for setting the knives, which, with our way, can be set to 1-1000 of an inch.

The second is our way of holding the knife without tapping into the head.

The third is the correct angle of cut for the knives.

Made for Any of the Different Makers' Machines and in Any Length Cylinder.

WRITE FOR PRICES

SHIMER CUTTER HEAD CO. OF CANADA, LIMITED

Manufacturers of Cutter Heads, Safety Cylinders and Grinders

GALT, ONTARIO

The Mereen-Johnson Resaw

has many features of advantage which place it far ahead of anything in the Resaw field.

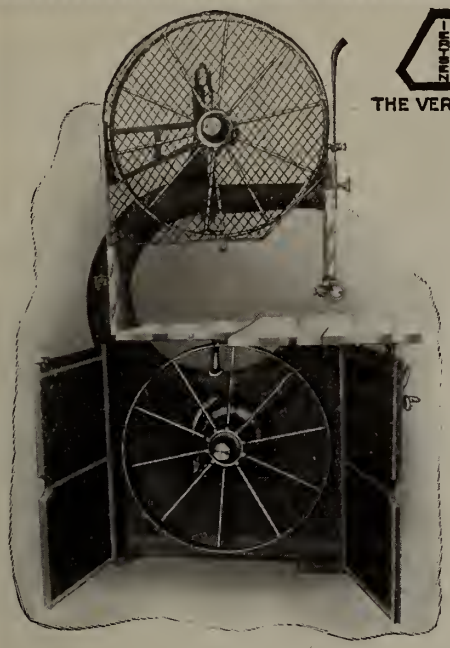
No pulleys—no belts—no frictions.

The sprocket and chain arrangement for changing speeds is only one of the many improvements on this machine.

Write for circular.

Mereen-Johnson Machine Co.

Minneapolis - Minnesota, U.S.A.



THE VERY BEST

West Side

Plain, symmetric, a model of concise, compact design, a West Side band saw offers utmost capacity for good work. A machine for every purpose, each possessing very real advantages of operation.

We would particularly direct attention to the uncommon strength of our band saws. They are of liberal proportions where the strain comes. They stand up to constant work under hardest usage.

A New Motor Driven 36" Band Saw

--shown to the left. Most convenient of all to use. Its every adjustment is reached without change of position for the operator. A perfectly balanced machine on which best work and satisfactory production are assured.

Write us now for information which should help in a wise choice of band saw; direct motor drive--belt drive--gear drive-

West Side Iron Works

Factory: Grand Rapids
General Offices: Chicago.

Speed Up the Work

No Breakdowns - No Delays

With

"BEAVER" BAND-SAWS

NOTE—When measuring points count the points at each end of inch, as per illustration. 3 points are two teeth, etc.

When there is a big cutting job ahead in the sawmill, box factory or woodworking shop, RADCLIFF SAWS are the ones to rely on. They will give you the greatest satisfaction.

BEAVER BAND-SAWS are made from the highest grade Swedish Crucible Steel—keen-cutting and strong. Let us send you particulars and prices.

Radcliff Saw Manufacturing Company, Limited

1550 Dundas Street West **TORONTO, ONT.**

AGENTS FOR L. & I. J. WHITE CO., MACHINE KNIVES

The Taylor TRADE MARK

The Taylor TRADE MARK

Clamp Carrier

Largest Capacity
Smallest Floor Space

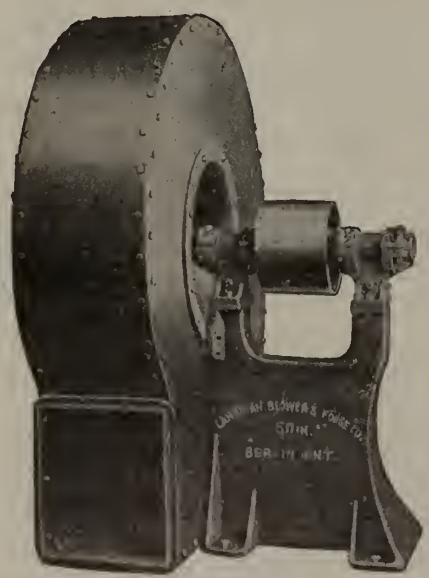
Quickest Acting
Most Powerful Clamp Known

One user writes:—" Additional equipment has so speeded up our Jointing Department as to necessitate the installation of a TAYLOR CLAMP CARRIER."

A. R. WILLIAMS MACHINERY CO., Toronto, Canada—Representatives

James L. Taylor Manufacturing Co.

POUGHKEEPSIE, N. Y.



Canadian Planing Mill Exhauster

Keep your shop clean, remove your sawdust, shavings, or other loose material.

A clean shop with machines free from shavings, chips or sawdust makes for greater efficiency.

Let our engineering department help you plan your refuse exhaust system.

Write for Catalogue 400-13

Canadian Blower & Forge Co.

KITCHENER, ONT.

MILL PIPING

Shaving and Sawdust Collecting Systems Installed Complete

ALTERATIONS — REPAIRS

Neville-Cooper Co.

130 Ontario St. Toronto

Phone Main 2157

We also manufacture and erect Smoke Stacks, Boiler Breechings, Metal Cornices, Skylights, Eavetrough, etc.

"CASCO" Waterproof Glue

Mixed Cold—Used Cold

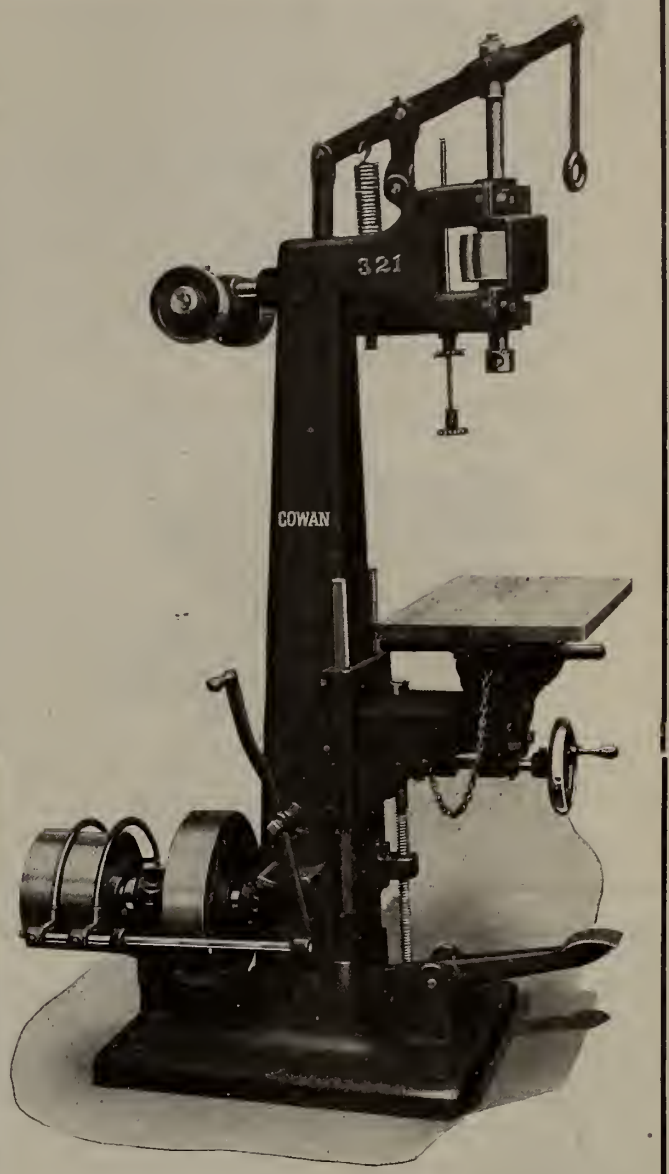
Simple to prepare—can be applied with your present equipment. Comparative tests have convinced thousands of manufacturers of the merits of "CASCO" for jointing and veneering, both from the standpoint of quality and cost. Why not let us tell you about it?

The Casein Manufacturing Co.

Manufacturers of Casein Glues for twenty-five years

15 PARK ROW NEW YORK CITY

NOTE. Send for Casco Red Book. It contains much information on glue, veneer and panels.



Borer 321

Tilting and Plain Table.
Simple to Adjust. Easy to Operate.
Strong, Steady and Accurate.
Spindle 12 in. from post; travels 6 in.
Table 14 in. x 28 in.
Adjusts 15 in. Vertically.

Prices of this or other WOODWORKING MACHINERY on application.

Cowan & Company of Galt

Limited

Galt Ontario Canada

Know Your Exact Output

The **Productimeter** is a real meter of production. It is **always dependable,** always on the job, and never forgets to tally.

Can be used on such machines as moulders, stickers, flooring machines, and self feed saws.

Built substantially to withstand the hard usage it is liable to receive.

Gives you the **absolutely correct** total of work that goes through. Its visibility, alone, is an important factor in spurring your workmen to greater efforts.

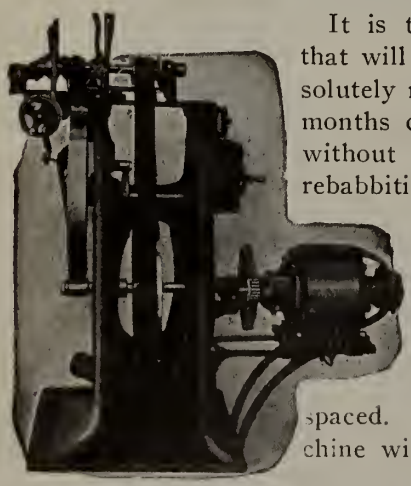
Our faith in the **Productimeter** is such that we will send you one for a thirty days' trial. If it doesn't make good, send it back in good order, and we'll cancel the charge.

Durant Manufacturing Co.
615 Buffum St. Milwaukee, Wis.

The Berry Combination Band and Circular Automatic Saw Sharpener

Belt or Motor Driven. Capacity: Bands, 3-16" to 4", Circulars 4" to 32". Simple, Universal, Automatic in Action.

It is the only *combination* grinder that is *automatic*



It is the only grinder that will grind a saw absolutely round after three months continuous use—without readjustment or rebabbiting. It will take an unevenly spaced, hand-filed saw and make it perfectly round and even spaced. No other machine will do this.

For All Shops Using Circular or Band Saws

The Berry Tooth is far superior to the ordinary peg tooth. All teeth are alike, evenly spaced—ground right from the center. A saw ground with this machine does twice the work in half the time.

Write for Booklet to-day.

O. V. HOOKER & SON
St. Johnsbury Vermont

Operate on Dry Heat

"INTERNATIONAL" Electric Glue Heaters

are built on the fireless cooker heat retaining principle. No water both to boil dry and cause burnouts, no burnt glue.

Even dry heat gives more accurate temperature control and lower current consumption.

Woodworkers and other manufacturers who desire to reduce their glue costs should write for our bulletin ***"Correct Temperature in the Glue Room"*** and complete information about International Electric Glue Heaters.

INTERNATIONAL ELECTRIC COMPANY
MANUFACTURERS
ELECTRICAL HEATING APPLIANCES
INDIANAPOLIS, U.S.A.

Canadian Distributors
R. E. T. PRINGLE, LTD.

TORONTO
95 King Street East
WINNIPEG
703 Confederation Life Bldg.
MONTREAL
401 New Birks Bldg.
VANCOUVER
402 Vancouver Block

"International Electric Heaters are Better."

As the water is squeezed out— so the steam will be turned on!

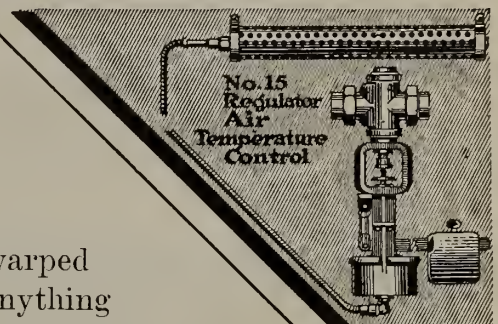
This is no parable—it is business sense. As values become more staple—and they are very near the positive point now—so, and then, will our prosperity wave begin. Then you will need more steam. Provide those new Boilers you need NOW. We make the best of them. All types and sizes.

Engineering and Machine Works of Canada, Limited

St. Catharines, Ont.

Eastern Sales Offices:
Hall Machinery Co., Sherbrooke Que., and Birk's Bldg., Montreal

Stop That Waste of Heat in the Kiln



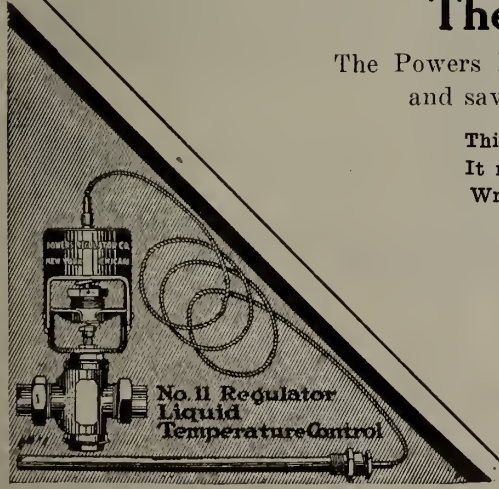
Hand control of kiln temperatures and humidity results in warped and checked lumber, which means waste. No danger of anything like this happening when the Powers is on the job.

Automatic control of temperature and humidity, results in lumber evenly and thoroughly cured, without warping or checking.

The Powers Heat Regulator

The Powers Regulator automatically controls temperature and humidity, and saves from a quarter to a third of the time in kiln-drying lumber

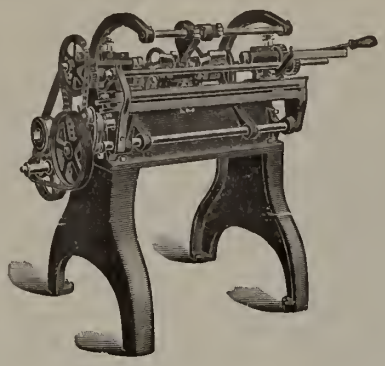
This means quite a saving when added to eliminated waste.
It regulates profits upwards.
Write us and learn how the POWERS does it.



The Canadian Powers Regulator Co., Limited

Specialists in Automatic Heat Control

82 CHESTNUT STREET TORONTO



PROTECT YOURSELF

Against lowering prices by WORKING YOUR WASTE into turned work of various kinds.

The 22 inch No. 2 OBER LATHE shown above will turn a large variety of work that can be made from waste and other low grade timber.

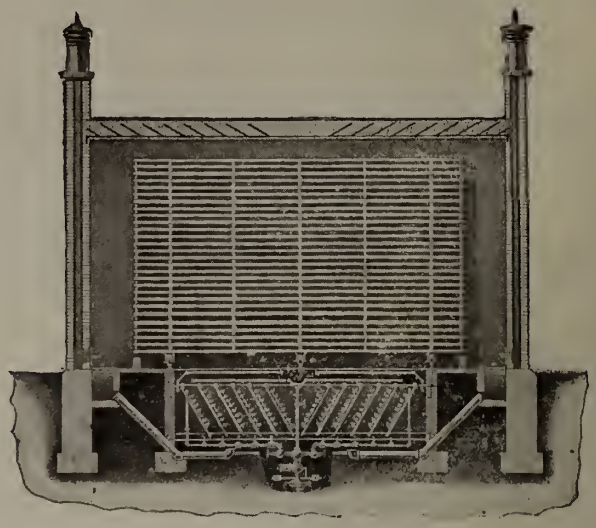
We also build other machines for doing other turned work.

Write for free catalogue No. 31

THE OBER MFG. CO.

CHAGRIN FALLS. O., U.S.A.

Thermo-Myst System



BEFORE YOU BUILD

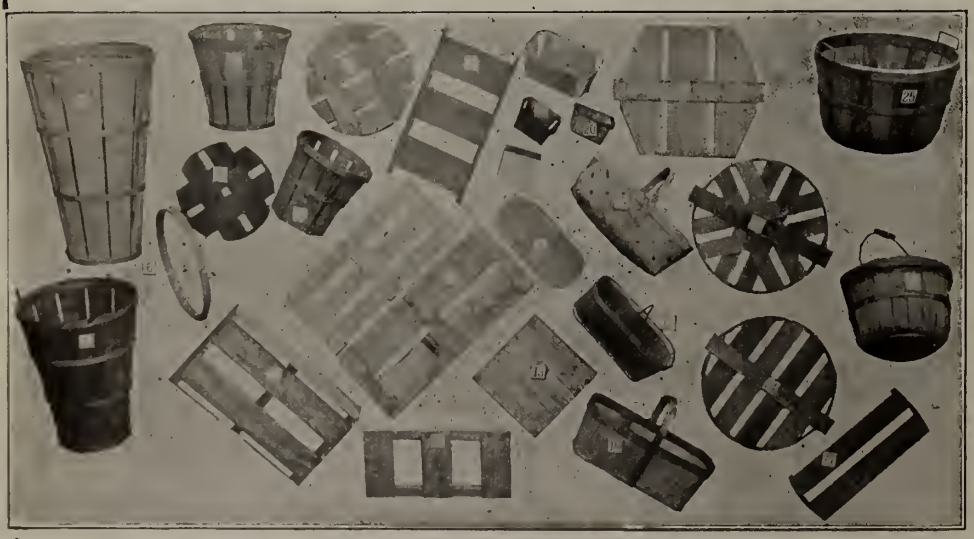
DRY KILNS

Investigate the merits of our system. Catalog and layouts mailed on request.

Curtis-Hosey Dryer Co. of Canada

177-179 Duke Street, MONTREAL, P.Q

THIS IS THE NAME



of the Machinery for the Rapid Production of

Veneer—Crates—Baskets—Fruit Packages.

"St Joe"

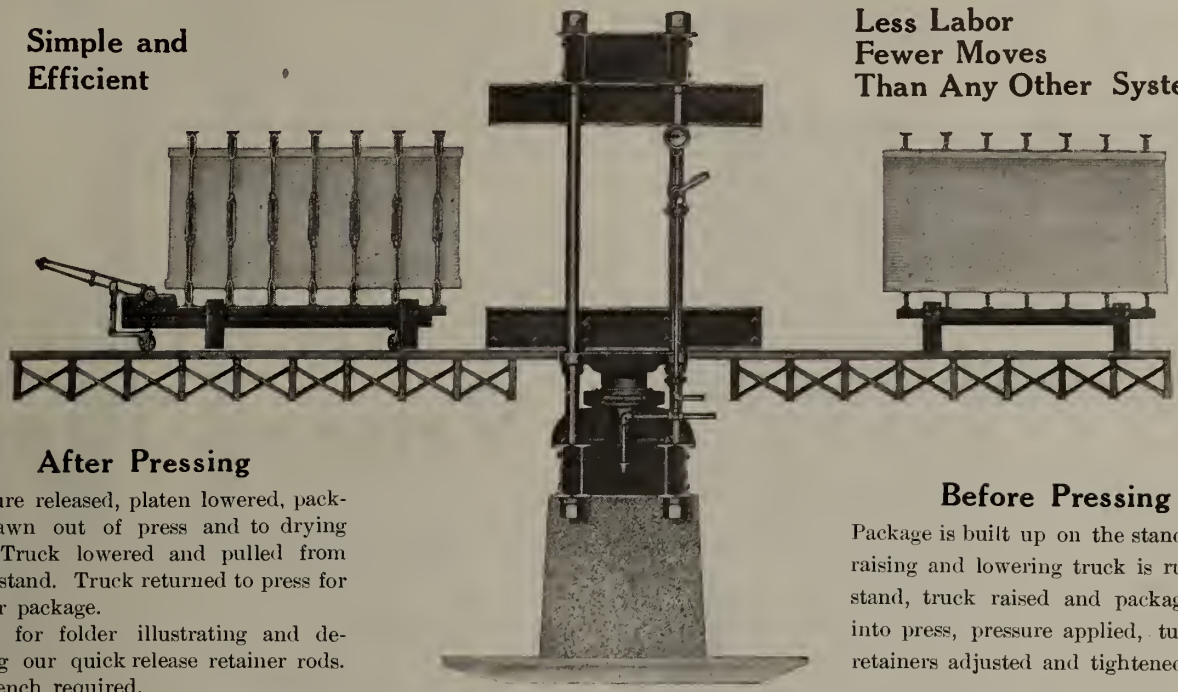
Get the name fixed in your mind.

ST. JOSEPH IRON WORKS, St. Joseph, Michigan

The Van Atta System of Veneer Package Pressing & Handling

Simple and Efficient

Less Labor Fewer Moves Than Any Other System



After Pressing

Pressure released, platen lowered, package drawn out of press and to drying floor. Truck lowered and pulled from under stand. Truck returned to press for another package.

Write for folder illustrating and describing our quick release retainer rods. No wrench required.

Before Pressing

Package is built up on the stand. Specia raising and lowering truck is run under stand, truck raised and package drawn into press, pressure applied, turnbuckle retainers adjusted and tightened.

E. B. VAN ATTA & CO., Inc.
Manufacturers of Hydraulic Presses and Pumps
OLEAN, N. Y.

NEW YORK OFFICE
50 Church Street

CHICAGO REPRESENTATIVE
Fader Machinery Co., Inc.
549 Washington Boulevard

FOR 25% MORE POWER

FOR PULLEY ADHESION

FOR LIGHT RUNNING

CHICAGO RAWHIDE BELTING

No Bark, Acids, Lime or other Chemicals used in the Cure

YOU GET THE FULL STRENGTH AND PLIABILITY OF SELECTED SWISS HIDES

TRANSMITS PERFECTLY AT 7500 FEET PER MINUTE
Breaking Strength 5440 pounds per Square Inch
Guaranteed Not to Stretch

MECHANICAL LEATHERS LIMITED

126 Garden Avenue, Toronto

Canadian Representatives — Chicago Rawhide Manufacturing Company

If made of hide for mechanical purposes we have it

No Scraping
No Sanding

TROY MAGIC PLYWOOD TAPE simplifies the manufacture of plywood by eliminating the time and labor-wasting process of seraping and sanding.

TROY MAGIC requires less soaking than others and works easier, faster, better. A quick, steady jerk rips off the entire length in one pieee and leaves a smooth, elear, clean surfaee.

The speeial Troy Kraft Paper it is made of insures a maximum toughness and strength and the gumming—made after our own private formula—moistens readily, sets quickly, dries almost instantly.

Try this time and labor saver. It means money to you. We'll gladly send you a sample coil upon request We also make cloth plywood tape.

The
Gummed Products Co.
TROY OHIO

TROY SEALING TAPES

CANADIAN · NASHUA · PAPER · CO. LTD
SERVICE PRODUCTION QUALITY
NASHUA
TRADE MARK
PETERBOROUGH ONT.

NASHUA Veneer Tapes

Are manufactured with a view to giving the consumer the material for his purpose, and we stand ready to develop any special requirement for you.

In purchasing our tapes you are assured of prompt, **service** guaranteed **quality** and a reasonable **price.**

Samples of our stock will be sent upon request, so that you may try them out in your plant in a practical way.

CLOTH and PAPER
Guaranteed Veneer Tapes

THE CANADIAN NASHUA PAPER CO., Ltd.
Peterborough, Ont.

Furniture work Chair work Sash and door work

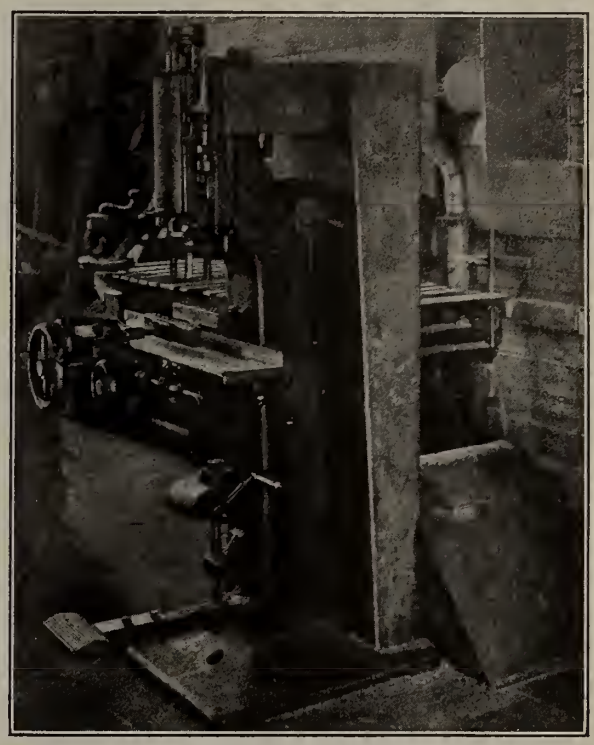
You expect more of the

"Oliver" Hollow Chisel Mortiser

than you expect of an ordinary machine, and you have a right to.

Like all "Oliver" wood-working machinery this No. 91 Mortiser is built to machine tool standards.

It performs its work by means of a hollow chisel with a high speed bit revolving within.



The illustrated machine is installed in a prominent plant in the Pittsburg District.

Woodworking Machinery of Quality manufactured by

Oliver Machinery Co.

GRAND RAPIDS, MICH., U. S. A.

MAPLE LEAF SAWS

Maple Leaf Saws will give you just that steady, day-in-day-out service that means so much in your plant They are made with this object in view. The whole process of their manufacture, from the selection of the highest grade steel to the time they leave our hands is attended to with the greatest care.

The complete line includes Bands, all kinds of Special Saws for Special Work, Cross-cut Saws, Gang Saws, Dado Heads, etc. Every one guaranteed to merit your approval.

Write for a copy of our catalogue.

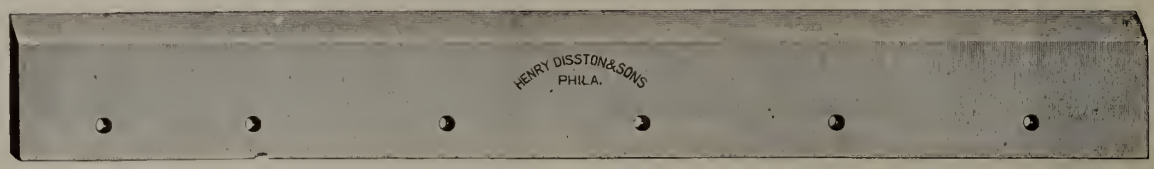
The Largest All-Canadian Saw Manufaoturers

SHURLY - DIETRICH, LIMITED, GALT, CANADA

Store and Repair Branches at Vancouver and Ottawa

DISSTON

ALL STYLES OF KNIVES FOR WOODWORKERS



Are you getting the maximum production from your knife equipment? With the present necessity for greatly increased production, be sure your knives will give you the best possible results.

Disston knives cut fast and clean ,and hold their cutting edge.

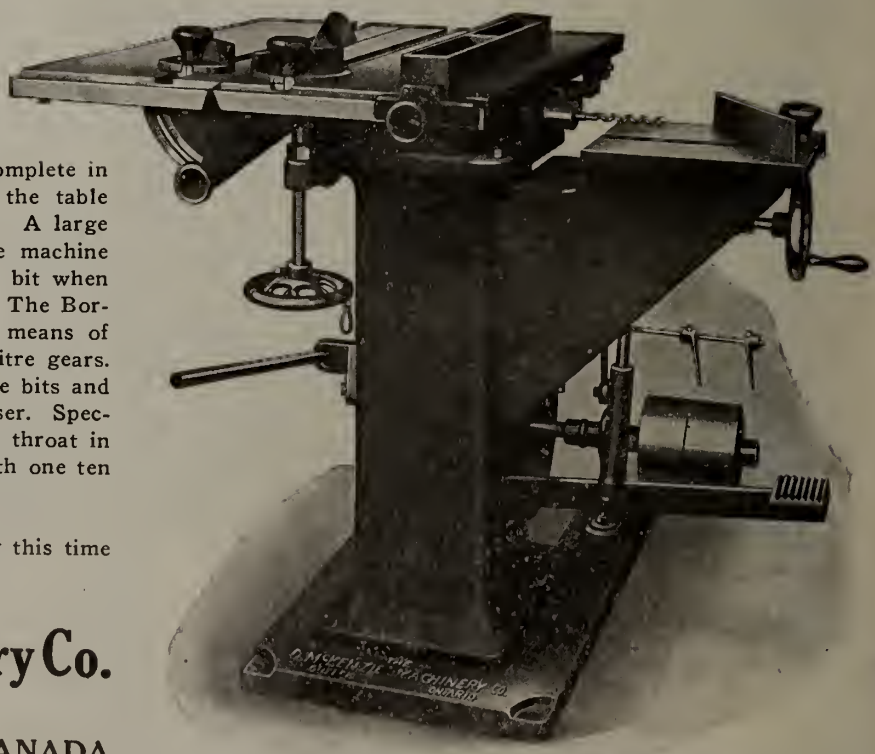
Write for the Disston booklet on Machine Knives.

HENRY DISSTON & SONS LIMITED
TORONTO CANADA
Branch: Vancouver, B. C.

The Handiest Machine on the Market

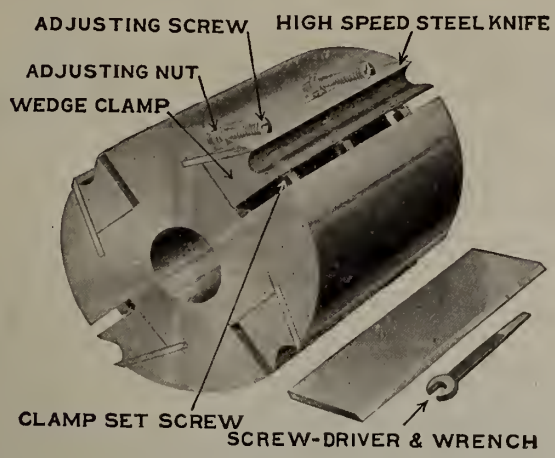
The Split-tilting table (Patent Applied For) can be tilted and locked at any angle up to forty-five degrees as indicated on the graduated segment. This machine is also supplied with a solid table. The Boring Attachment is very complete in itself. A foot lever is connected with the table which slides back and forth on the knee. A large coil spring located in the column of the machine automatically releases the work from the bit when pressure is removed from the foot lever. The Boring Attachment is raised or lowered by means of a handwheel connected with a pair of mitre gears. The spindle is bored to take standard size bits and can be arranged for a hollow chisel mortiser. Special cutters may be used by removing the throat in the table. Each machine is furnished with one ten inch saw, belt and wrench.

Write for prices and pamphlet describing this time and labor saver more fully.



D. McKenzie Machinery Co.
MANUFACTURERS
GUELPH, ONT. CANADA

Cross-cut Mitre & Rip Saw Machine showing Split-Tilting Table & Boring Attachment



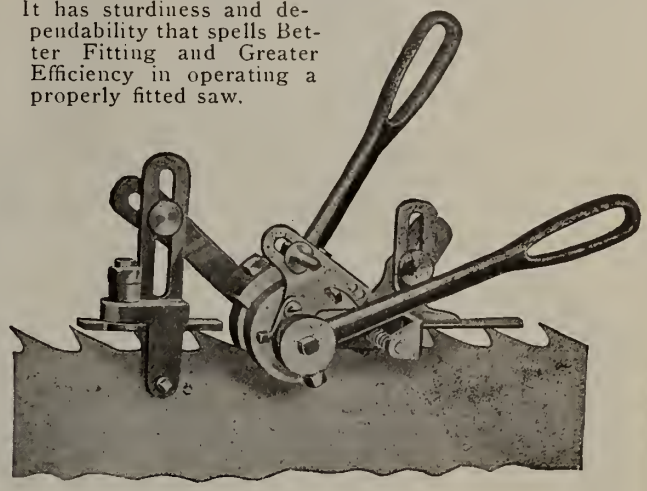
The PORTER "C" Slip-on-Head for Shapers, Jointers and Moulders will cut straight or cross grain without tearing. Irregular shaped knives can be used as well.

There are over 3,000 of these Heads in daily use.
Write for circular and quotation.

C. O. Porter Machinery Co.
GRAND RAPIDS, MICHIGAN, U.S.A.

Quality Higher--Price Lower

The construction of the Crowell Swage is the secret of CROWELL SUPERIORITY—Right Design, Reliable, Simple and Easily Adjusted for all sizes of saws—The Swage that is Just A Little Better All Around—It has sturdiness and dependability that spells Better Fitting and Greater Efficiency in operating a properly fitted saw.



D. J. CROWELL
61 TERRACE, BUFFALO, N.Y., U.S.A.

Canadian checks accepted at PAR

All Crowell Swages reduced to pre-war prices

Do Not Gamble on Your Veneer Tapes

BUY THE BEST.

Ideal Veneer Tapes

The material with the guarantee behind it

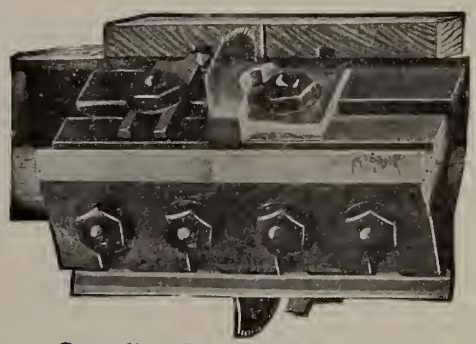
Profit by our many years' careful application to the subject of Veneer Tapes.

We have several qualities, cloth and paper, plain and perforated, which will cover all of your requirements.

Write for booklet.

IDEAL COATED PAPER CO.
Veneer Tape Specialists
Main Offices and Mills, BROOKFIELD, Mass.

The Shuff Sticker Saw Head Attachment



Canadian Patent No 212337

This attachment will double your moulder production, widening its range of performance and effecting a real saving in the running of pully stiles, blind stops, cove, parting stops, window stops, fillet, glass bead, base moulding, ceiling, lattice moulding, screen moulding, base shoe, quarter round, stools, panel moulding, etc. Used for splitting moulding when two or more are run at the same time, a decided improvement over the flat knives for this purpose ; also used for rabbeting and grooving.

The attachments are furnished in pairs of rights and lefts, are made of solid brass, each pair properly balanced and saws sharpened and set before shipment. Made in all sizes to fit any moulder. When ordering send sketch of end view of sticker head. Cut smooth and are easily set up. Price $30, 00 in American funds f.o.b. Waukesha, Wis.

Manufactured by

JOHN SHUFF P.O. Box 45, 145 Barston St. Waukesha, Wis.

An Efemco Product

For Every Metal Bed

It's an Efemco caster—a new one—and that's recommendation enough. Note the groove in the bottom leaves of the spring. The leaves come together when the spring is pushed into tube—thus giving added rigidity of contact and forming a bearing in which the stem turns freely. The top of stem is swedged—no danger of caster dropping out. Secure, rigid grip in either round or square tube.

We also supply this caster in the ball—or roller bearing types. Up to 1½ in. size it is finished with cupped washers. Above that size with leg mounts.

When ordering please specify maple, lignum-vitae, steel, iron or fibre wheels.

Write for catalog showing new lines of improved **Efemco** Casters.

FOSTER, MERRIAM & CO.

Meriden, Conn. Hamilton, Ontario New York City

Efemco PRODUCTS

Grip Neck Casters
Ball Bearing Casters
Roller Bearing Casters
Truck Casters
Automobile Accessories
Piston Rings
Grey Iron Castings

Standardized by 86 years of service

Efemco Products / Efemco Products / Efemco Products / Efemco Products / Efemco Products / Efemco Products

Perkins Vegetable Glue

Was born in a small way in Florida not so very many years ago; almost at once it made its way into the largest and best woodworking factories, and for a decade past has been considered the

STANDARD QUALITY

The Picture Shows The Present Home of

PERKINS 183

TRADE MARK (Reg. U.S. Pat. Off.)

Our Canadian Factory is located at Hamilton, Ont.

This growth has been made possible because the majority of the glue using trade was alive to the opportunity of

PERKINS QUALITY and PERKINS SERVICE

Ask any one of our customers what this means in his factory: there are many who have used our glue steadily for ten, twelve, and thirteen years.

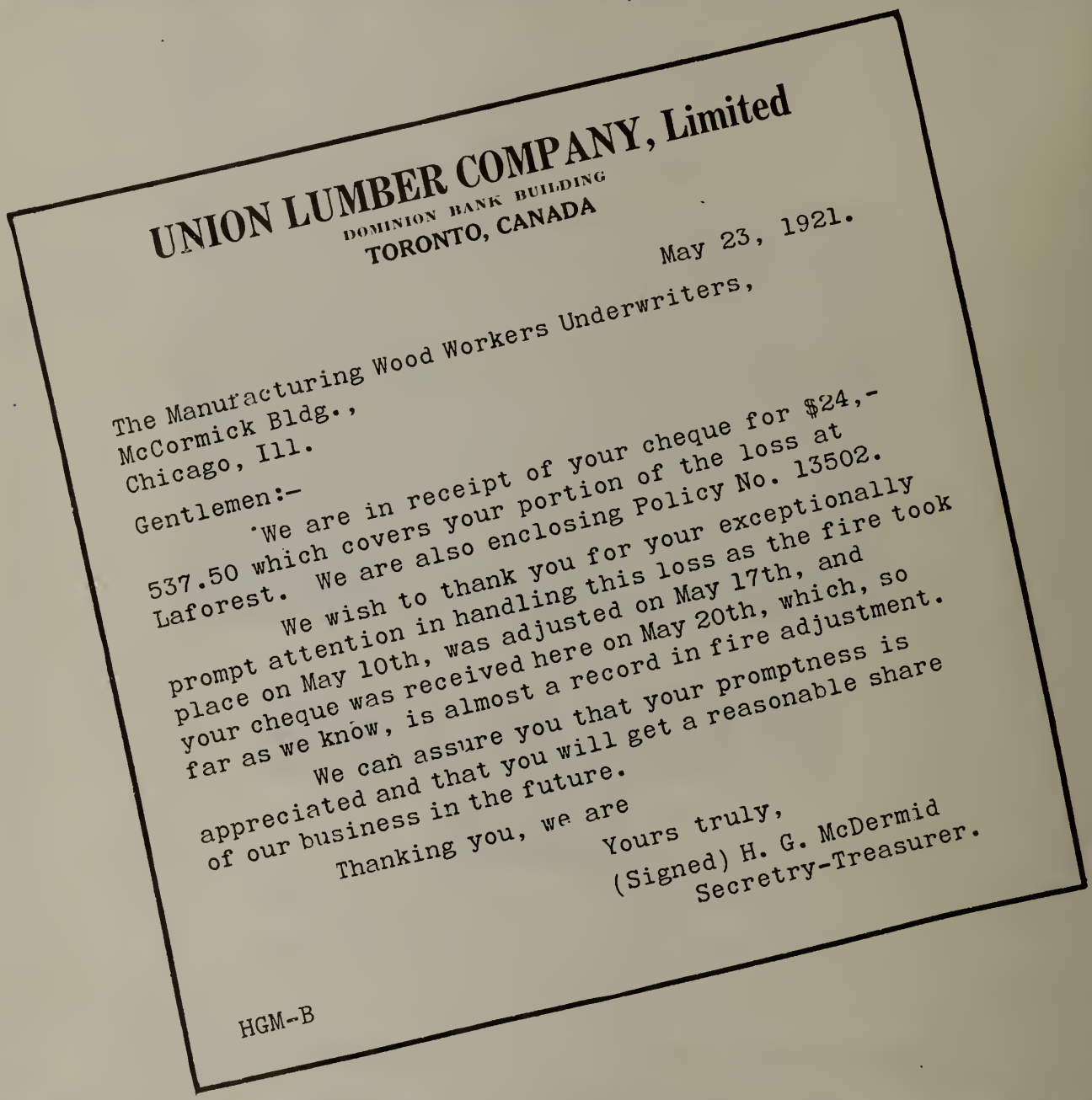
Process and Product Patents covering Perkins Glue were granted July 2nd and March 19th, 1912, and have been held valid and infringed by the United States Circuit Court of Appeals. Patents have also been granted in Canada, Great Britain, Germany, France, Belgium, Italy and other foreign countries.

PERKINS GLUE COMPANY

Factory and General Offices:
Lansdale, Pennsylvania

Sales Office:
South Bend, Indiana

Can Anyone Think of an Argument to Beat This



UNION LUMBER COMPANY, Limited
DOMINION BANK BUILDING
TORONTO, CANADA

May 23, 1921.

The Manufacturing Wood Workers Underwriters,
McCormick Bldg.,
Chicago, Ill.

Gentlemen:-

We are in receipt of your cheque for $24,-
537.50 which covers your portion of the loss at
Laforest. We are also enclosing Policy No. 13502.

We wish to thank you for your exceptionally
prompt attention in handling this loss as the fire took
place on May 10th, was adjusted on May 17th, and
your cheque was received here on May 20th, which, so
far as we know, is almost a record in fire adjustment.

We can assure you that your promptness is
appreciated and that you will get a reasonable share
of our business in the future.

Thanking you, we are

Yours truly,
(Signed) H. G. McDermid
Secretry-Treasurer.

HGM-B

The above letter speaks for itself and, as usual, our check was the first received

We are not the largest fire insurance organization in the world, nor are we the oldest, but we have the strength of the strongest and our check is always first.

HERE IS OUR RECORD. In the past two years there have been sixteen heavy fire losses and with all the different forms of insurance mediums interested, in fourteen cases our check was first, the other two cases it was second.

Licensed in Canada and legal everywhere

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LEE BLAKEMORE, INC., (Atty. in FACT) CHICAGO, ILL.

OAKEY'S

Glass Paper, Flint Sand Paper, Garnet Paper

IN SHEETS AND ROLLS FOR ALL PURPOSES

Rolls 50 yards long, 18 in., 20 in., 24 in., 30 in., 36 in., 40 in., 42 in. and 48 in., wide

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BLUE DIAMOND NEENAH

Wood Products

ROTARY CUT SINGLE PLY GUM and POPLAR	DESK and TABLE TOPS in all WOODS	THREE and FIVE PLY PANELS in all WOODS	VENEERED and SOLID DOORS STANDARD and SPECIAL

Manufactured by

Hardwood Products Company

NEENAH, WISCONSIN

E. T. Carter & Co. Limited

Quality Guaranteed

FIBRO PRODUCTS
REEDS - WASTE - RESIN
TURPENTINE
RATTANS - LINTERS

Prompt Shipment

84 Front Street, E. - Toronto

NAILS AND WIRE

For Every Need in the Woodworking Industry

Bale ties, Nails and Wire of every description are manufactured by us. We manufacture to your order.

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Mr. Norman Jessiman, 505 Hastings St. W., Vancouver, B.C.
Head Office and Works: HAMILTON, CANADA

Panel Veneer in Exceptionally Fine Figuring

Beautiful

BLACK WALNUT

Virginia Timber

Choice Stock for Floor Lamps and Candle Sticks.

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WASHINGTON,
D.C., U.S.A.

Saw, Veneer and Export Logs

Courtesy Kelton-Aurand Mfg. Co

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Art-Fibre is all that its name implies. Spun from the finest quality of sulphite stock, its smooth uniform surface produces results when properly finished, that correlates with the most artistic designs and the finest quality of upholstering materials.

Because of its known reliability, economy, and excellent quality ART FIBRE SERVES BEST.

Samples and prices sent upon request.

GRAND RAPIDS FIBRE CORD CO.
Grand Rapids, Michigan

SPECIAL DRY STOCK

60,000 ft. 5/4 Basswood
400,000 ft. 4/4 Birch Selects & No. 1 Common
200,000 ft. 8/4 Birch No. 1 C & B
200,000 ft. 16/4 Birch No. 1 C & B 12″ average.

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Dry Lumber in Buffalo for Quick Shipment

TENNESSEE SCENTED CEDAR

1 in.	92,700′	No. 1 Com. & Btr.
1¼ in.	5,000′	

CHERRY

	1&2	Clear Strips	No. 1 Com.	No. 2 Com.
1 in.	157,500	200	182,200	128,500
1¼ in.	3,500	......	21,600	2,500
1½ in.	10,000	......	37,700	26,300
2 in.	7,000	......	21,200	64,900
2½ in.	6,500	......	3,700	2,200
3 in.	28,700	......	3,500	3,300
4 in.	5,900	......	......	500

CHESTNUT

	1&2	Clear Strips	No. 1 Com.	No. 2 Com.
¾ in.	1,000	......	51,000	103,000
1 in.	......	665	4,300	163,500
1¼ in.	171,800	300	89,200	199,200
1½ in.	51,500	......	52,000	......
2 in.	22,200	......	17,300	126,200
2½ in.	4,000	......	1,500	500
3 in.	2,100	......	1,300	500
4 in.	1,500	......	300	......

PLAIN RED GUM

		1&2	No. 1 Com.	No. 2 Com.
1 in.	......	25,300	13,000	15,500
1¼ in.	......	......	325	......
1½ in.	......	......	4,300	9,500
2 in.	......	......	......	7,500

QUARTERED RED GUM

	1&2	No. 1C	No. 2C
4/4	6,000	20,000	12,100
5/4	5,100	3,800	......
6/4	3,900	4,500	......
8/4	19,100	7,500	3,600

PLAIN WHITE OAK

	1&2	Clear Strips	No. 1 Com.	No. 2 Com.
⅝ in.	10,150	......	500	16,900
¾ in.	142,900	......	251,000	83,000
1 in.	16,300	1,700	129,000	85,200
1¼ in.	28,300	......	4,500	5,000
1½ in.	111,500	......	72,000	18,000
2 in.	94,000	......	131,000	65,000
2½ in.	176,800	......	56,500	3,000
3 in.	106,800	......	65,800	14,400
3½ in.	5,500	......	3,000	1,500
4 in.	77,000	......	22,500	6,000

PLAIN RED OAK

⅜ in.	24,200	......	......	......
¾ in.	104,000	......	124,000	33,200
⅝ in.	......	......	84,000	53,600
1 in.	95,200	3,550	133,000	142,400
1¼ in.	90,700	2,400	13,000	......
1½ in.	168,900	4,300	68,200	40,000
2 in.	148,100	......	180,800	71,000
2½ in	78,100	......	24,000	3,700
3 in.	28,800	......	20,500	7,000
4 in.	18,600	......	8,900	......

QUARTERED SAP GUM

	1&2	No. 1C	No. 2C
4/4	......	2,500	12,000
5/4	14,000	......	......
8/4	2,000	......	......
10/4	350	24,000	3,000

SAP GUM

		1&2	No. 1 Com.	No. 2 Com.
1 in.	......	3,400	6,000	200
1¼ in.	......	......	400	......
1½ in.	......	2,400	6,000	13,500
2 in.	......	......	5,700	10,400
2½ in.	......	......	......	......

QUARTERED RED OAK

	1&2	Clear Strips	No. 1 Com.	No. 2 Com.
¾ in.	1,700	......	9,700	400
1 in.	24,200	5,400	10,500	1,400
1¼ in.	3,000	......	3,000	500
2 in.	1,000	......	7,400	......

QUARTERED WHITE OAK

	1&2	Clear Strips	No. 1 Com.	No. 2 Com.
½ in.	6,500	......	......	......
¾ in.	550	300	23,600	9,000
⅝ in.	2,800	......	5,500	800
1 in.	57,400	18,000	61,400	27,000
1¼ in.	700	......	300	......
1½ in.	3,500	......	400	......
2 in.	......	......	25,100	5,700
2½ in.	1,000	......	......	......

POPLAR

	1&2	No. 1 Com.	No. 2 Com.	Bright Sap
⅝ in.	10,800	41,300	600	20,800
1 in.	42,000	208,900	127,000	23,200
1¼ in.	4,300	700	30,000	4,000
1½ in.	......	17,000	20,500	......
2 in.	6,600	5,500	24,500	1,800
2½ in.	4,800	......	......	......
3 in.	30,900	12,000	47,000	3,600
4 in.	......	......	450	......

BLACK WALNUT

		1&2	No. 1 Com.	No. 2 Com.
1 in.	......	1,200	......	14,400
1¼ in.	......	2,200	21,300	1,200
1½ in.	......	125	200	100
2 in.	......	100	4,500	1,900

Also Large Stocks of Ash, Basswood, Beech, Birch, Hard and Soft Maple.

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MANUFACTURERS SOUTHERN HARDWOOD LUMBER

Yards: BUFFALO, N Y.

Mills: KNOXVILLE, TENN.; FONDE, KENTUCKY

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Will make attractive prices for 4/4 Birch and Elm; immediate shipment. Also have good stock in all thicknesses, Soft & Hard Maple, Ash, and Basswood. Write us for quotations.

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We specialize in the following Crating lumbers
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WHITE ASH			**BIRCH**		
11,000′	4/4	No. 2 C&B	30,000′	4/4	FAS
BROWN ASH			90,000′	4/4	No. 1 Com.
60,000′	4/4	No. 1 C&B	150,000′	4/4	No. 2 Com.
16,000′	6/4	No. 1 C&B	30,000′	5/4	No. 1 Com. & FAS
8,900′	8/4	No. 1 C&B	45,000′	6/4	FAS
BASSWOOD			60,000′	6/4	No. 1 Com.
75,000′	4/4	Sel. & Fas.	75,000′	6/4	No. 2 Com.
100,000′	4/4	No. 1 & 2. Com.	100,000′	8/4	Sel. & Fas.
75,000′	6/4	No. 1 Com. & FAS	150,000′	8/4	No. 1 Com.
50,000′	6/4	No. 2 Com.	100,000′	8/4	No. 2 Com.
40,000′	8/4	No. 1 C&B	75,000′	10/4	Sel. & Fas.
MAPLE			125,000′	10/4	No. 1 Com.
75,000′	4/4	Log Run	250,000′	12/4	Sel. & Fas.
BEECH			100,000′	16/4	Sel. & Fas.
65,000′	4/4	Log Run	**SOFT ELM**		
			45,000′	4/4	No. 2 C&B
			21,000′	6/4	No. 1 C&B
			22,000′	8/4	No. 1 C&B

150,000′ 4/4 Basswood, Birch, Ash, Elm No. 3 Com. Under National Rules.

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Plain, Straight and Spiral Grooved

"Canada Wood" dowels are manufactured from high-grade Maple, Birch, Beech or White Oak, uniform in length and nicely pointed, quality guaranteed.

We also manufacture Bailwoods and Variety Turnings in all styles, sizes and descriptions, in the plain, or Enamelled in Black, Natural Wood or Mahogany finishes. Three-eighth in. Maple, Birch and Quarter Cut White Oak Flooring a Specialty. Broom and Mop Handles of every description.

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Orillia, Ontario
Sawmills at Zebra and Orillia, Ont.
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Write or "Phone" for Prices. Mills at South River, Ont.

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Hard & Soft Maple
Rock & Soft Elm
Beech & Birch
Basswood
Hardwood, in 4x4, 4x6, 1" & 2" No. 3 Com.

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Stock on Hand in Kitchener for Immediate Shipment

3,000	ft.	4/4 x 10 in. and up Qt'd White Oak Fas.
12,000	"	4/4 x 6 in. and up Qt'd White Oak Fas.
15,000	"	4/4 x 6 in. and up Qt'd White Oak No. 1 com.
2,680	"	3/4 x 13/17 Sap Gum Fas.
4,700	"	3/4 x 3/12 Sap Gum No. 1 Com.
400	"	5/4 x 6 in. Plain red Gum Fas.
4,000	"	4/4 x 6 in. up Sap Gum No. 1 Com.
5,000	"	8/4 x 6 in. up Qt'd red Gum C. & B.
8,000	"	5/4 x 6 in. Plain White Oak Fas. ... ...
2,000	"	6/4 x 4 in. Plain White Oak No. 1 Com.
15,000	"	6/4 x 6 in. Plain red Oak Fas.
10,000	"	8/4 x 6 in. Plain red Oak Fas.
25,000	"	8/4 x 4 in. Plain red Oak No. 1 Com.
12,000	"	4/4 x 3 in. Tenn. Red Cedar No. 1 C. & B.
25,000	"	8/4 Sound Wormy Chestnut
2,000	"	5/4 Sount Wormy Chestnut
32,000	"	6/4 Sound Wormy Chestnut
5,000	"	4/4 Chestnut No. 1 C. & B.
10,000	"	5/4 Chestnut No. 1 C. & B.
10,000	"	6/4 Chestnut No. 1 C. & B.
43,000	"	4/4 Soft Elm No. 3 C. & B.
1,000	"	4/4 Soft Elm No. 3 Common
12,000	"	8/4 Soft Elm No. 2 C. & B.
15,000	"	12/4 Soft Elm No. 2 C. & B.
5,285	"	12/4 Oak No. 2 Common & Better
6,000	"	12/4 Oak No. 2 and 3 Common
12,000	"	4/4 Hard and soft Maple No. 3 C. & B.

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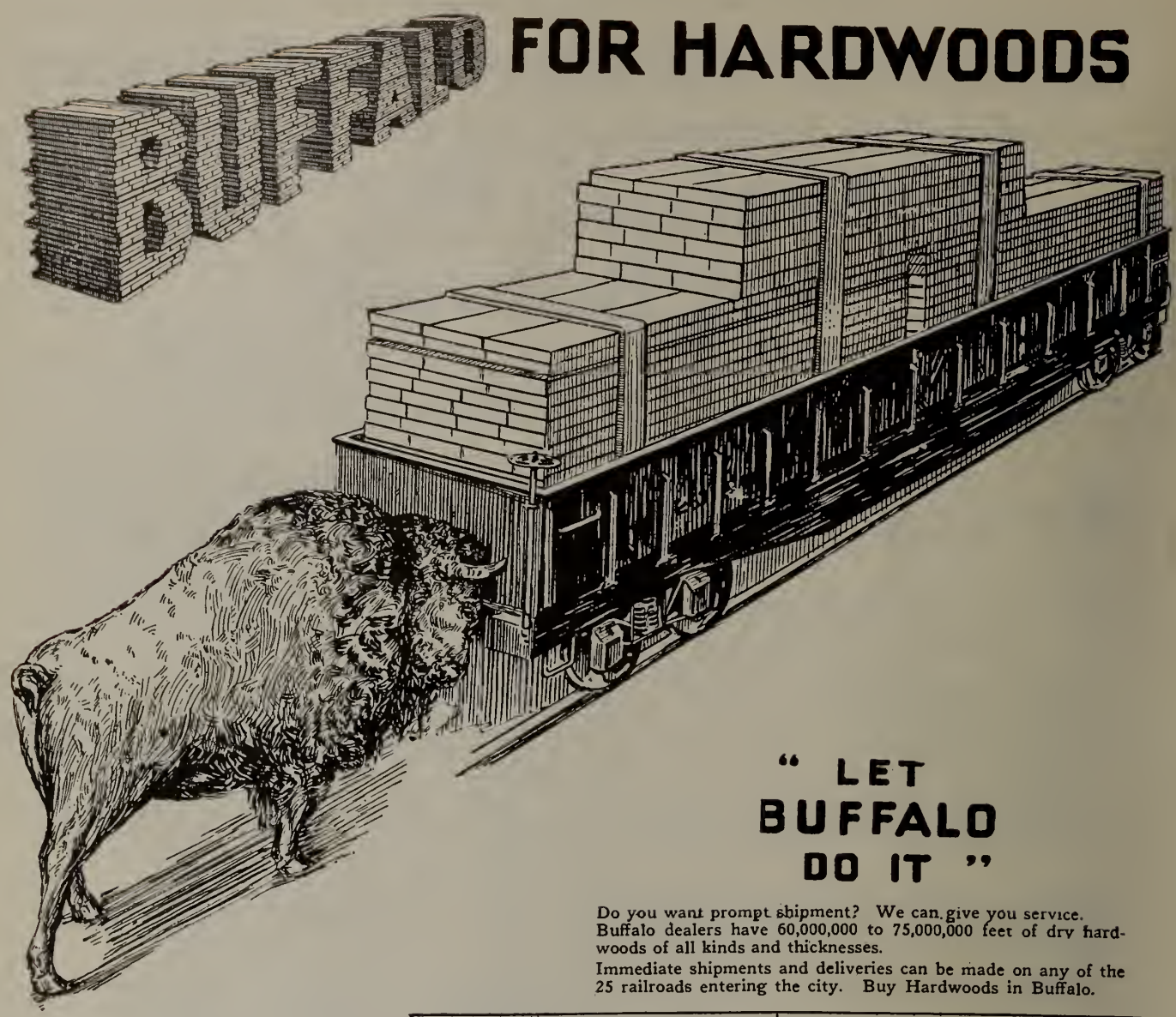
BUFFALO FOR HARDWOODS



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Hardwoods
Prompt Shipments { From Buffalo Yards or from Mill direct to you
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Established 1881
All Kinds of Hardwood Lumber
And in addition we carry a full line of White Pine, Yellow Pine, Spruce, Hemlock and Fir Timber, Lumber, Millwork and Boxes—Maple and Oak Flooring
Careful attention to mixed car orders.

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T. H. WALL, V.-Pres.
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We Specialize in White Ash, Oak & Maple
We also handle a complete stock of Quartered Oak, Maple, Poplar, Red Cedar, etc.

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Hardwoods of All Kinds
Our Specialties—QUARTERED WHITE OAK, SAP AND RED GUM
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A stock of 18,000,000 to 20,000,000 feet of hardwoods carried at all times at our two big Buffalo Yards
Established 50 Years
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A Complete Stock of Seasoned Hardwoods
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Furniture,
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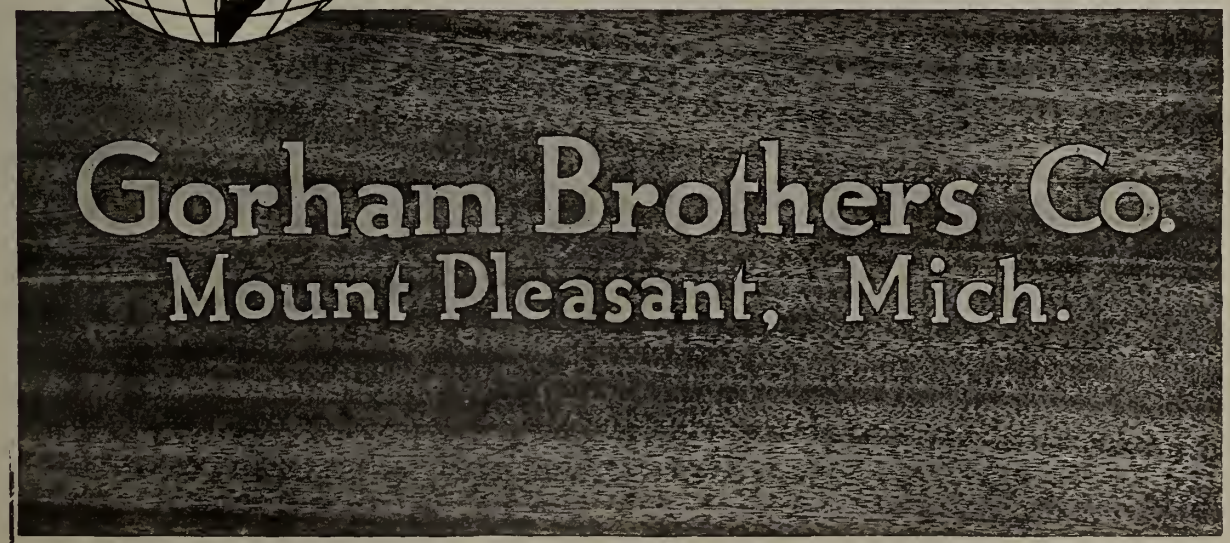
is well and favorably known in Canada as well as the States and its use in the form of Tops, Drawer Fronts, End Panels etc., in your product, will be a long step in securing the confidence of your customers which will result in orders and re-orders.

Our trademark is stamped on the back of every Top and Panel we make. Our guarantee that it is right and will stay right.



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Makes your dry-kiln doors steam-tight and saves time, heat, trouble and money.

Carrier lifts door clear of kiln and carries it down track. Returning, deposits door to rabbeted joint, where it is held steam-tight by its own weight. Applicable to old or new kilns.
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1 Band Mill — *5 Circular Mills*

Hardwood Lumber

Oak	Basswood
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Chestnut	Poplar
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Rotary-Cut Soft Yellow Poplar Veneers
Quarter-Sawn White Oak Flitches
Sliced and Sawn Quartered White OakVeneers
Oak and Maple Flooring
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RED OAK	MAPLE
CHESTNUT	BEECH
POPLAR	HICKORY

Our own facilities for Surfacing, Resawing and Kiln Drying

Arkla Lumber & Mfg. Company

Main Office: - St. Louis, Mo.

Manufacturers and Wholesalers

Ash—Plain and Qtd. White and Red Oak Poplar, Cypress, Gum

In addition to stocks at Mill, we carry a well assorted dry stock of all items on our St. Louis yard available for immediate shipment. Write or wire us (our expense) for quotations.

F. HUNTINGTON SMITH
Canadian Representative

Mercerau-Hawkins Tie Company

Huntington - W. Va.

Manufacturers and Wholesale Dealers

West Virginia and Southern

HARDWOODS

We specialize in

Oak Tie Siding
White and Red Oak
Yellow Poplar
Basswood
Chestnut and
Gum Lumber.

Canadian Sales in Charge of

C. W. PETERS

Vice President and Manager of Lumber Dept.

RUSH LUMBER COMPANY

Manufacturers Southern Hardwoods

Band Mill and Office - Memphis, Tenn.

ASH
2 cars 5/4 No. 2 Com. & Btr.

CYPRESS
1 car 4/4 Shop & Btr.

ELM
3 cars 6/4 Log Run
1 car 8/4 Log Run
1 car 12/4 Log Run

PLAIN RED GUM
1 car 4/4 Com. & Btr.
1 car 5/4 Com. & Btr.
2 cars 4/4 No. 1 Common
2 cars 4/4 No. 2 Common

QTD. RED GUM
2 cars 4/4 No. 1 Common
1 car 6/4 F.A.S.
1 car 6/4 No. 1 Common
1 car 8/4 Com. & Btr.

QTD. RED GUM S.N.D.
2 cars 8/4 No. 1 & Btr.
1 car 10/4 No. 1 & Btr.
1 car 12/4 No. 1 & Btr.

PLAIN SAP GUM
1 car 4/4 F.A.S.
3 cars 4/4 No. 1 Com.
3 cars 4/4 No. 2 Com.
2 cars 4/4 No. 3 Com.
1 car 5/4 Com. & Btr.
2 cars 5/4 No. 2 Com.
1 car 5/4 No. 3 Com.

QTD. BLACK GUM
3 cars 4/4 No. 1 Com. & Btr.
1 car 4/4 No. 2 Com.

PLAIN BLACK GUM
1 car 4/4 Log Run

HICKORY
1 car 6/4 Log Run

QTD. WHITE OAK
2 cars 4/4 No. 1 & Btr.
3 cars 4/4 No. 1 Com.
1 car 4/4 No. 2 Com.
1 car 4/4 2½ to 5½ Cl. Strips
1 car 4/4 1½ to 3 Com. Strips.
2 cars 5/4 No. 1 & Btr.
1 car 6/4 No. 1 Com.

PLAIN WHITE OAK
3 cars 4/4 No. 1 Com.
1 car 4/4 No. 2 Com.
1 car 4/4 No. 1 Com. & Btr. Sound Wormy
1 car 5/4 No. 1 Com. & Btr.
1 car 5/4 No. 1 Com.
1 car 6/4 No. 1 Com.
1 car 5&6/4 No. 3 Com.

PLAIN RED OAK
3 cars 3/4 No. 1 Com. & Btr.
1 car 4/4 No. 1 Com. & Btr.
3 cars 4/4 No. 1 Com.
2 cars 4/4 No. 2 Com.
2 cars 5/4 No. 1 Com. & Btr.
1 car 5/4 No. 1 Com.
1 car 6/4 No. 1 Com. & Btr.

POPLAR
1 car 4/4 F.A.S.
1 car 4/4 Saps & Select
2 cars 4/4 No. 1 Com.
2 cars 4/4 No. 2 Com.
1 car of Dogboards.

Dacus-Richards Hardwood Co.

A. P. DACUS - H. J. RICHARDS

MANUFACTURERS

Southern Hardwood

Specializing in

RED GUM
SAP GUM

PLAIN AND QUARTERED

OAK

Randolph Building,
Memphis, Tennessee.

Mills at EVANSVILLE, Miss., and PRITCHARD, Miss.

Perkins Brothers

Kelso, Ark.

Manufacturers of

Southern Hardwoods

Quartered and Plain White Oak, Plain Red Oak, Gum Elm, Maple, Ash and Cypress

We are also prepared to cut dimension stock to order in Ash, Oak, Gum, Hickory and Elm.

Let us know your requirements.

L. D. LEACH & COMPANY

FISHER BUILDING, - CHICAGO, Ill.

Manufacturers Hardwood Lumber

6 Cars 4/4 No. 1 Common Red and White Oak
5 Cars 4/4 No. 2 Common Red and White Oak
4 Cars each 8/4 in. No. 1 and No. 2 Com. R. and W. Oak
2 Cars each 10/4 in. and 12/4 in No. 1 and No. 2 Common Red and White Oak

Oak Furniture — Vehicle and Car Stock Dimensions Sawed to Order

4/4 in. Gum—All Grades
4/4 in. Cypress—All Grades
4/4 in., 8/4 in. and 10/4 in. Log Run Soft Elm

WE offer for prompt shipment the following dry, well manufactured, St. Francis Basin, band sawn hardwoods :—

Quartered White Oak	Quantity	Average Width	Percentage 14 & 16 ft.	Age
4-4 FAS	10,000	7½"	80	5 mos.
5-4 FAS	28,000	7½"-8"	50	5 mos.
6-4 FAS	3,500	7½"-8"	50	6-8 mos.
8-4 FAS	3,000			6-8 mos.
3-4 No. 2 C & B mostly miscuts	3,200			6-12 mos.
4-4 No. 1 Common	400,000		60	5-8 mos.
5-4 No. 1 Common	15,000		60	5 mos.
6-4 No. 1 Common	4,000			6-8 mos.
8-4 No. 1 Common	4,000		50	6-8 mos.
4-4 No. 2 Common	100,000		45	6-8 mos.
Plain White Oak				
4-4 No. 1 Common	500,000		60	5-8 mos.
5-4 No. 1 Common	50,000	9-10"	50	6 mos.
6-4 No. 1 Common	50,000		40	8-10 mos.
8-4 No. 1 Common	50,000		40	6 mos.
5-4 FAS	30,000		50	6 mos.
6-4 FAS	12,000	9-10"		10 mos.
4-4 No. 2 Common	350,000		55	6-8 mos.
Quartered Red Oak				
4-4 No. 1 & 2 Com.	30,000		55	5-8 mos.
Plain Red Oak				
5-4 FAS	30,000	9-10"	40	6-8 mos.
6-4 FAS	14,000	9-10"	25	6 mos.
8-4 FAS	20,000	9-10"	50	6 mos.
4-4 No. 1 Common	600,000		60	5-8 mos.
5-4 No. 1 Common	30,000		45	6-8 mos.
6-4 No. 1 Common	15,000		25	6 mos.
8-4 No. 1 Common	40,000		50	6 mos.
4-4 No. 2 Common	600,000		60	6-8 mos.
Plain Red & White Oak				
4-4 Sound Wormy	75,000			6-8 mos.
4-4 No. 3 Common	500,000			6-8 mos.
Quartered Red Gum				
5-4 No. 1 Common	12,500		60	8-10 mos.
6-4 C & B 75 p.c. FAS	15,000	5" & Up	65	7 mos.
8-4 No. 1 Common	3,000			1 yr.
8-4 No. 1 Common SND	10,000	5-6"	80	1 yr.
Plain Red Gum				
5-8 No. 1 C & B	1,100		50	1 yr.
3-4 No. 1 C & B	1,800		50	6-8 mos.
5-4 No. 1 C & B	8,500		60	4 mos.
6-4 FAS	14,000		75	12-14 mos.
6-4 No. 1 Common	43,000		75	12-14 mos.
Plain Sap Gum				
4-4 FAS	50,000	13-17"	60	6-8 mos.
4-4 Box Boards	75,000	9-12"	60	6-8 mos.
4-4 Pan & Wd. No. 1	3,500	18" & Up		6-8 mos.
5-4 No. 1 Common	100,000	9"	60	6-8 mos.
5-4 FAS	50,000	10-10½"	60	6-8 mos.
6-4 FAS	15,000	9-9½"	60	1-3 mos.
6-4 No. 1 Common	35,000		60	1-3 mos.
4/4 No. 1 Common	200,000		65	1-6 mos.
Ash				
4-4 FAS	18,000	7½"-8"	30	1-3 mos.
4-4 No. 1 Common	42,000	7½"-8"	30	1-3 mos.
6-4 FAS	3,500		30	6 mos.
6-4 No. 1 Common	3,500		30	6 mos.
8-4 FAS	15,000		35	1-3 mos.
8-4 No. 1 Common	15,000		35	1-3 mos.
10-4 FAS	32,000		40	6-8 mos.
10-4 No. 1 Common	32,500		40	6-8 mos.
12-4 FAS	7,500		30	1-2 mos.
12-4 No. 1 Common	7,500		30	1-2 mos.
16-4 No. 1 C & B	2,800		30	4-6 mos.
Cottonwood				
4-4 FAS	100-000	6-12"	70	8-10 mos.
4-4 FAS	30,000	13-17"	50	8-10 mos.
4-4 Pan & Wd. No. 1	5,000		30	8 mos.
4-4 Box Boards	30,000	9-12"	60	8 mos.
4-4 Box Boards	20,000	13-17"	60	8 mos.
4-4 No. 1 Common	100,000		60	6-8 mos.
4-4 No. 1 Common	50,000		60	1-3 mos.
4-4 No. 2 Common	100,000		70	3-6 mos.
Elm				
8-4 FAS	18,000		60	2 mos.
8-4 No. 1 Common	27,000		60	2 mos.
10-4 FAS	14,400		70	6 mos.
10-4 No. 1 Common	21,600		70	6 mos.
12-4 FAS	8,000		40	1-2 mos.
12-4 No. 1 Common	12,000		40	1-2 mos.
Maple				
4-4 No. 2 C & B	100,000		50	4-6 mos.
5-4 No. 2 C & B	60,000		60	6-8 mos.
6-4 No. 2 C & B	27,000		60	6-8 mos.
8-4 No. 2 C & B	40,000			6-8 mos.
8-4 No. 2 C & B	80,000		50	2-3 mos.

MILLER LUMBER COMPANY MARIANNA, ARKANSAS, U.S.A.

SAM D. SMITH

Wholesale Dealer and Manufacturer in

NORTHERN and SOUTHERN HARDWOODS

305 Kent Building, Toronto

Specialty—Sawing Dimenison Stock to Order

The Hyde Lumber Co.

Band Mills: LAKE PROVIDENCE LA.
Southern Office: MEMPHIS, TENN.
Bank of Commerce Bldg.
Northern Office: SOUTH BEND, IND.

MANUFACTURERS

Plain Red Gum
Quartered Red Gum
Plain Sap Gum
Quartered Sap Gum
Cottonwood, Cypress
Tupelo, Ash, Elm, Oak

CHARLES O. MAUS
Canadian Representative

Chas. F. Luehrmann Hardwood Lumber Co.

Manufacturers and Wholesalers of

Hardwood and Yellow Pine Lumber

Office and Yard: 148 Carroll St. St. Louis, Mo

Hardwood and Yellow Pine for Immediate Shipment from Stock

Complete Stock of Built Up Panels
3 and 5 Ply—Carried in Stock at St. Louis

FIR DRAWER BOTTOMS
FIR DOOR PANELS

Write us for our Stock and Price List

Aromatic Tennessee Red Cedar

CAR LOAD LOTS
OR LESS

Earthman Lumber Co.
Murfreesboro, Tenn.

Quality plus Service

AT RIGHT PRICES

Let us quote you on concave chair seat, turned office, piano, restaurant and bath-room stool tops.

Solid table tops, cabinet work; in fact woodwork of all description.

Algoma Wood Products Co.
ALGOMA, WIS.

Sawed Veneer

Quartered White Oak
For Furniture and Panels

Plain Red Oak
For Interior Trim and Doors

Cypress
For Battery Separators

Manufacturing Uniformly Good.
Quality Unsurpassed

James E. Stark & Co., Inc.
MEMPHIS, TENN.

BEDNA YOUNG
Lumber Company

Jackson - Tennessee

Manufacturers of

Quartered White Oak
Quartered Red Oak
and Other Hardwoods

When in the market for
High Grade Lumber
please let us have your enquiries.

Sales Office: 610 Lombard Bldg.
Indianapolis, Indiana

OAK FMA

MEMPHIS BRUCE LITTLE ROCK

EXPONENTS
of
Highly Perfected
Manufacture
and
Merchandising Service
in
Arkansas Hardwoods
Including
Band Sawn
White and Red Oak
Ash — Gum
and
***Bruce* OAK FLOORING**
THE BEST *Oak Flooring*
Including
Square Edged
Parquetry Strips

Inquiry and Correspondence Invited

E. L. BRUCE COMPANY
MANUFACTURERS
MEMPHIS, TENNESSEE
Flooring Plants: LITTLE ROCK—MEMPHIS
Band Mill: LITTLE ROCK

We specialize in Birch, Basswood, Hard Maple

A High Standard of Quality and Service

500M	4-4	Unselected	Birch	500 M	4-4	Basswood		500M	4-4	Hard Maple	
300M	5-4	"	"	300M	5-4	"		400	5-4	"	
150	6-4	"	"	200	6-4	"		400	6-4	"	
125	8-4	"	"	75	8-4	"		600	8-4	"	
150	10-4	"	"					400	10-4	"	
150	12-4	"	"					300	12-4	"	
75	14-4	"	"					75	14-4	"	
75	16-4	"	"					100	16-4	"	

Sawyer Goodman Company

Marinette - Wisconsin

WE ARE TELLING THE PUBLIC: "BE SURE YOUR WALNUT IS ALL WALNUT"

AMERICAN WALNUT

WE ARE TELLING THE PUBLIC: "BE SURE YOUR WALNUT IS ALL WALNUT"

"The Cabinet-wood Superlative."

"IS THIS ALL WALNUT?"

Steadily increasing numbers of American Walnut furniture buyers are asking dealers this question.

This Association desires to help furniture manufacturers and distributors to profit in this development of the public's buying power by passing along such authentic information as the above for mutual benefit.

By making your Walnut pieces *ALL WALNUT* you can insure profits for maker and dealer, and also "*Give the Public What it Asks For.*"

In all our National advertising in the general magazines appears this significant phrase:

"BE SURE YOUR WALNUT IS ALL WALNUT"

AMERICAN WALNUT MANUFACTURERS' ASSOCIATION

ROOM 1019 616 SOUTH MICHIGAN BOULEVARD CHICAGO

Reese Sheriff Lumber Co.

WILLIAMSPORT, PENNSYLVANIA

Manufacturers of

Northern and Southern Hardwoods White Pine, Spruce and Hemlock

With special attention to **Oak, Chestnut, Poplar, Cherry, Walnut, Gum and Basswood.**

OUR MOTTO

REASONABLE PRICES - that you can afford to pay.
EFFICIENT SERVICE — that you have a right to expect
FAIR TREATMENT — that you can depend on getting

We would appreciate an opportunity of furnishing a portion of your lumber requirements.

TO MEET COMPETITION

It will be necessary to put better lumber into your product. Indiana Oak is known to be the best. It costs no more than the other kinds—then why not get it?

We are the largest manufacturers of hardwoods in Indiana and give you below a partial list of the stock that we have ready for shipment:

INIDIANA QUARTERED WHITE OAK

	1s&2s	No. 1 C.	No. 2 C.
1/2"	1 car	1 car	
5/8"	2 "	4 "	
3/4"	1 "	5 "	1 car
4/4"	3 "	4 "	4 "
5/4"	1 "	3 "	1 "
6/4"	1 "	3 "	
8/4"	1 "	2 "	

Also Clear and No. 1 Common Quartered White Oak Strips .

INDIANA QUARTERED RED OAK

	1s&2s 6"&up	1s&2s 9"&up	No. 1 C.	No. 2 C.
1/2"	3500'			
5/8"	1 car		1 car	
4/4"	3 "	1 car	3 "	1 car
5/4"	2 "	1 "	2 "	
6/4"	2 "	2500'	1 "	
7/4"	1 "	4500'		
8/4"	2000'	3000'	1 "	

PLAIN WHITE OAK

	1s&2s	No. 1 C.	No. 2 C.
5/8"	1 car	1 car	
3/4"		4000'	
4/4"	2 cars	4 cars	2 cars
5/4"	1 "	3 "	1 "
6/4"	1 "	2 "	
8/4"	3 "	2 "	
2½"	½ "	1 "	

PLAIN RED OAK

	1s&2s	No. 1 C.	No. 2 C.
5/8"	2 cars	2 cars	
3/4"		5000'	
4/4"	4 cars	4 cars	3 cars
5/4"	1 "	3 "	
6/4"	1 "	4 "	
8/4"	2 "	3 "	
2½"	2 "	3 "	

BLACK WALNUT—Steamed Stock

	1s&2s	No. 1 C.	No. 2 C.
4/4"	1 car	3 cars	12000'
5/4"	1 "	1 "	9000'
6/4"	4000'	4000'	
8/4"	1 car		

1 car 5/8" Log Run, not steamed.

WE ARE IN POSITION TO KILN DRY THIS LUMBER. ASK FOR OUR RATES.

We also have good stocks of Poplar, Ash, Beech, Hickory, Maple, Gum, Tupelo, etc.—Write us for prices.

Maley & Wertz Lumber Company

EVANSVILLE, INDIANA

We guarantee that our Walnut Lumber after having been steamed in our Steam Kilns for four days, then placed on sticks for six days, during fair weather, can be placed in your Dry Kilns immediately and dried with greater safety than unsteamed lumber, green from the saw and placed on sticks for ninety days. This method of steaming lumber enables us to furnish material without delay.

QUALITY

SERVICE

Full loaded capacity of nine kilns, 100,000 feet.

American Walnut Lumber

All grades and thicknesses

Pickrel Walnut Company

St. Louis, Missouri

Stimson Veneer and Lumber Co.

(Inc.)

Office and Mill: McLean Ave. and Union Belt R.R.

Memphis - Tenn.

We sell only the product of our own mills and make band sawn lumber in all Southern Hardwoods.

We specialize in Quartered White Oak, Red Oak, and Red Gum.

With allied companies we make fifty million feet annually.

J. V. Stimson Hardwood Co.

Manufacturers and Exporters

Band Mills: Memphis, Tenn., Helena, Ark.

Memphis - Tenn.

STOCK LIST

QUARTERED WHITE OAK
- 3 cars 4/4" 1s and 2s.
- 5 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common .

QUARTERED RED OAK
- 5 cars 4/4" 1s and 2s.
- 10 cars 4/4" No. 1 Common.
- 4 cars 4/4" No. 2 Common.
- 2 cars 6/4" No. 1 Common and Better.

QUARTERED RED GUM
- 10 cars 4/4" 1s and 2s.
- 3 cars 4/4" 1s and 2s Fig.
- 2 cars 5/4" 1s and 2s.
- 2 cars 6/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 2 cars 5/4" No. 1 Common.
- 2 cars 6/4" No. 1 Common.

QUARTERED RED GUM, Sap no Defect
- 5 cars 6/4" No. 1 Common and Better.
- 10 cars 8/4" No. 1 Common and Better.

ASH
- 4 cars 10/4" No. 1 Common and Better.
- 1 car 12/4" No. 1 Common and Better.
- 1 car 6/4" No. 1 Common and Better.
- 2 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common.

SAP GUM
- 10 cars 4/4" 1s and 2s.
- 20 cars 4/4" No. 1 Common.
- 10 cars 4/4" No. 2 Common.
- 2 cars 4/4" 18" up Panel.
- 5 cars 4/4" 13-17" Box Boards.

PLAIN RED OAK
- 2 cars 4/4" 1s and 2s.
- 2 cars 6/4" No. 1 Common and Better.
- 2 cars 10/4" No. 1 Common and Better.

PLAIN WHITE OAK
- 4 cars 4/4" No. 1 Common Plain.

COTTONWOOD
- 2 cars 4/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 5 cars 4/4" No. 2 Common.

ELM
- 2 cars 4/4" Log Run.
- 10 cars 10/4" Log Run.
- 10 cars 12/4" Log Run.

MAPLE
- 4 cars 12/4" Log Run.

Dimension Stock you can depend on

One of the largest and best equipped Dimension Plants in the South offers you its facilities. Situated in the heart of the Blue Ridge Hardwood district. Capacity 1,500,000 Feet per Month.

CORE STOCK, Clear Flat Stock and Mouldings from Chestnut, Oak, Poplar, Basswood, Cypress or Tupelo Gum

Large Stock of Dry Lumber.
Perfect Kiln Drying.
Guaranteed Mill Work.

Won't you let us do for you what we have done for our own Northern Factories?

National Casket Co.
DIMENSION DEPARTMENT
Asheville, North Carolina

Nichols & Cox Lumber Co.

GRAND RAPIDS - MICHIGAN

We can ship promptly the following items. Can also kiln dry if desired.

2 cars	4/4	1st and 2nd	Sap Gum
5 "	4/4	No. 1 Com.	"
3 "	5/4	No. 1 Com. and Better	"
2 "	6/4	"	"
2 "	8/4	"	"
4 "	6/4	"	Qtd Sap Gum
5 "	8/4	"	"
3 "	10/4	"	"
2 "	12/4	"	"
2 "	4/4	"	Plain Red Gum
1 "	5/4	"	"
1 "	6/4	"	"
1 "	8/4	"	"
2 "	4/4	1st and 2nd	Plain Red Oak
3 "	4/4	No. 1 Com.	"
1 "	5/4	No. 1 C & B	"
1 "	6/4	"	"
1 "	8/4	"	"
1 "	4/4	1st and 2nd	Plain White Oak
2 "	4/4	No. 1 Com.	"
2 "	10/4	No. 1 Com. and Better	Birch
1 "	12/4	"	"
1 "	10/4	"	Basswood
5 "	6/4	No. 2 Com. and Better	Gray Elm
5 "	4/4 to 8/4	No. 1 Com. and Better End Dried	White Maple

Send us your enquiries for anything needed in Northern and Southern Hardwoods.

DIMENSION

My Specialty is

Dimension Lumber

For Manufacturers of

Wagons and Implements, Buggies and Autos, Furniture, Railroad Car and Track Material

Standard Sizes on Hand for Prompt Shipment. Special Sizes Cut to Order

SOUTHERN HARDWOOD LUMBER

C. B. COLBORN

438 Randolph Building

MEMPHIS - TENN.

West Virginia Oak

Thoroughly Dry, Accurately Sawn, Soft Textured, and Uniform in Color.

Write us when needing choice stocks. All lumber produced from virgin timber of large size and excellent quality.

Twenty Million Feet Hardwood Ready for Immediate Shipment

OAK

Yellow Poplar, Ash, Hickory, Beech, Chestnut, Basswood, Walnut, Maple

THE THOMAS HALL LUMBER COMPANY

Manufacturers

CHARLESTON, - WEST VIRGINIA

M. BROWN, Canadian Repres. Address: 87 Neville Park Blvd., Balmy Beach, Toronto

CHAPMAN and DEWEY LUMBER CO.

Manufacturers

Band Sawn — Carefully Graded

FURNITURE STOCK

10 Cars 5/4" FAS and No. 1 Com. Sap Gum
5 Cars 4/4" No. 1 Com. and Selects Sap Gum
3 Cars 4/4" No. 1 Com. and Selects Red Gum
5 Cars 4/4" No. 1 Com. and Selects Pl. Red Oak
2 Cars 4/4" No. 1 Com. and Selects Pl. White Oak

Also fully assorted stock in Ash, Soft Maple, Elm, Cypress, Cottonwood. We can save you freight by shipping stock, surfaced and resawn. We will gladly quote you delivered prices, payable Canadian funds.

Chapman and Dewey Lumber Co.
KANSAS CITY, Mo. MARKED TREE, Ark.

DRY STOCK

For Immediate Shipment

SOFT ELM
6905′ 1″ —No. 1 C&B
3195′ 1″ —No. 2 Com.
41030′ 1½″—No. 1 C&B
2356′ 1½″—No. 2 Com.
56880′ 2″ —No. 1 C&B
10046′ 2″ —No. 2 Com.
110594′ 2½″—No. 1 C&B
26985′ 2½″—No. 2 Com.
11750′ 3″ —No. 2 Com.

WHITE ASH
87846′ 2″ —No. 1 C&B
3072′ 2″ —No. 2 Com.
139960′ 2½″—No. 1 C&B
13537′ 2½″—No. 2 Com.
18992′ 3″ —No. 1 C&B
608′ 3″ —No. 2 Com.

HICKORY
650′ 1″ —No. 1 C&B
1408′ 2″ —No. 1 C&B

COTTONWOOD
1620′ 1″ —No. 1 C&B
19956′ 2″ —No. 1 C&B
1196′ 2″ —No. 2 Com.

BLACK WALNUT
2873′ 1″ —No. 1 C&B
1151′ 1″ —No. 2 Com.

WILLOW
1446′ 1″ —No. 1 C&B

CHERRY
4747′ 1″ —No. 1 C&B
2137′ 1″ —No. 2 Com.

ROCK ELM
12493′ 2″ —No. 1 C&B

SOFT MAPLE
14397′ 2½″—No. 1 C&B

BASSWOOD
1549′ 1″ —No. 1 C&B
606′ 2″ —No. 1 C&B

BUTTERNUT
2584′ 1″ —No. 1 C&B

HARD MAPLE
31788′ 1″ —No. 1 C&B
243927′ 1¼″—No. 1 C&B
227707′ 1½″—No. 1 C&B
1796′ 1½″—No. 2 Com.
217401′ 2″ —No. 1 C&B
11410′ 2″ —No. 2 Com.
38016′ 2½″—No. 1 C&B
11091′ 3″ —No. 1 C&B
2796′ 4″ —No. 1 C&B

BEECH
3000′ 1½″—No. 2 Com.
500′ 2″ —Log run
250′ 2½″—Log run
350′ 3″ —Log Run
100′ 4″ —Log run

BIRCH
15998′ 1″ —No. 1 C&B
22311′ 1¼″—No. 1 C&B
11748′ 1½″—No. 1 C&B
50157′ 2″ —No. 1 C&B
87172′ 2½″—No. 1 C&B
7866′ 3″ —No. 1 C&B

PLAIN OAK
9369′ 1″ —No. 1 C&B
1107′ 2″ —No. 1 C&B

The above stock is in our Battlecreek yard and we are so located that we can load and ship stock immediately upon receipt of your orders. We guarantee National Hardwood Lumber Association grades.

PAYSON SMITH LUMBER CO.
Plymouth Building - MINNEAPOLIS, Minn.

OAK

Plain and Quartered
Uniform Color—Soft Texture

Poplar, Ash

and other

Hardwoods

We carry 35,000,000 feet dry stock—all of our own manu facture.

Oak Timbers and Planking

The Mowbray & Robinson Co.
(INCORPORATED)
Manufacturers
Office: CINCINNATI, OHIO

MILLS
Quicksand, Ky.; West Irvine, Ky.

Canadian Representative :
A. K. Johuson, Traders Bank Building, Toronto, Ont

E. SONDHEIMER CO.

MEMPHIS, TENN., U.S.A.

Band Mills at
Baton Rouge, La., Sondheimer, La., Tallulah, La.
Office & Distributing Yard, Memphis, Tenn.

Manufacturers of Southern Hardwoods **Dry Stock Ready for Shipment**

Ask us for prices. We may be able to save you some money. We specialize in genuine Tensas Basin Red Gum—best in the world.

WHITE ASH
1 car each 1", 1¼", 1½" 1s&2s
2 " 2" 1s & 2s
7 " 1" No. 1 Com. & Sel.
3 " 1¼" No. 1 Com. & Sel.
1 " 1½" No. 1 Com. & Sel.
3 " 2" No. 1 Com. & Sel.
1 " each 2½" & 3" ditto
5 " 1" No. 2 Common
2 " 2" No. 2 Common
1 " 2½, 3½, 4" No. 2 Cm.

COTTONWOOD
5 " 1" 1s&2s
1 " 1½" 1s&2s
10 " 1" No. 1 Common
5 " 1¼" No. 1 Common
5 " 1½" No. 1 Common
3 " 1" No. 2 Common
4 " 1¼" No. 2 Common
10 " 1½" No. 2 Common
2 " 1x 9 to 12" Box Bds.
2 " 1x13 to 17" Box Bds.

CYPRESS
1 " 1" Shop
2 " 1" No. 1 Common
1 " each 1x 4, 1x 8", No. 1 Com.
1 " each 1x10, 1x12", No. 1 Com.
1 " 1" Pecky

SOFT ELM
2 " 1½" Log Run
5 " 2" Log Run

PLAIN SAP GUM
10 " each 1" & 1¼" 1s&2s
15 " 4/4" No. 1 Common
2 " 5/4" No. 1 Common
15 " 4/4" No. 2 Common
10 " 5/4" No. 2 Common
5 " 4/4" No. 3 Common

BLACK GUM
1 " 1" Log Run

PECAN
3 " 6/4" Log Run
4 " 8/4" Log Run

MAGNOLIA
2 " 1" No. 2 Common
1 " 1" No. 2 Common

QRTD. RED GUM
5 " 1" 1s&2s
3 " 1¼" 1s&2s
2 " 2" 1s&2s
1 " each 2½ & 3" 1s&2s
8 " 1" No. 1 Common
3 " each 1¼ & 2" No. 1 C.

QRTD. RED GUM
(Sap No Defect)
10 " 1" 1s&2s
1 " 1½" 1s&2s
3 " 2" 1s&2s
5 " 1" No. 1 Common
3 " each 1¼ & 2 "No. 1 C.

QRTD. WHITE OAK
3 " 1" No. 1 Common
1 " 1" No. 2 Common

QRTD. RED OAK
3 " 1" 1s&2s
5 " 1" No. 1 Common
2 " 1" No. 2 Common

PLAIN WHITE OAK
1 " 3/4" 1s&2s
1 " 3/4" No. 1 Common
6 " 4/4" No. 1 Common
5 " 4/4" No. 2 Common

PLAIN RED OAK
2 " each 1" & 1¼" 1s&2s
15 " 1" No. 1 Com. & Sel.
1 " 1¼" No. 1 Com. & Sel.
10 " 1" No. 2 Common
1 " 1¼" No. 2 Common
5 " 1" Sound Wormy
8 " 1" No. 3 Common

QRTD. TUPELO
1" 1s&2s

PLAIN-SAWN TUPELO
6 " 1" 1s&2s
10 " 1" No. 1 Common
5 " 1" No. 2 Common
1 " 1" No. 3 Common
1 " 1x13 to 17" Box Bds.

WILLOW
8 " 1" 1s&2s
5 " 1¼"1s&2s
1 " each 1½ & 2" 1s&2s
15 " 1" No. 1 Common
8 " 1¼" No. 1 Common
1 " 1½" No. 1 Common
10 " 1" No. 2 Common
8 " 1¼" No. 2 Common
10 " 1½" No. 2 Common
5 " 2" No. 2 Common
1 " 1x13 to 17" Box Bds.

Lumber
Walnut, Mahogany Plain and Quartered Oak, Ash, Cherry

Veneers
Walnut and Mahogany

WE specialize in AMERICAN BLACK WALNUT and can furnish straight cars from 3/8 to 4 inches in thickness. Also can load mixed cars WALNUT and MAHOGANY LUMBER and VENEERS, PLAIN and QUARTERED RED and WHITE OAK, ASH and HERRY.

The Kosse, Shoe and Schleyer Co.

Eastern Branch:
BALTIMORE, Md.

Main Office and Band Mill:
CINCINNATI, Ohio

30 Million Feet Hardwoods Yearly

Manufactured by

Darnell-Love Lumber Co.

Leland, Mississippi

We own and operate two large band mills with sufficient timber to supply these mills, at present capacity, fifteen to twenty years

Cutting

Oak, Ash, Gum, Elm

Cypress, Cottonwood

and various other Native Woods

Our Specialties are—

3/8", 1/2", 5/8" and 3/4" in Gum and Oak

and

8/4" Quartered Red Gum

8/4" Quartered Red Gum Sap No Defect

WE SOLICIT YOUR INQUIRIES AND ORDERS

Thompson-Katz Lumber Co.

Manufacturers of

WHITE ASH EXCLUSIVELY

In dealing with us the wood worker and furniture manufacturer may rightly expect a better service, better value and a greater selection from which to choose his requirements. We have all grades and all thicknesses to offer—beautiful stock that we know will please you. Drop us a card to-day—we'll do the rest.

MEMPHIS, TENNESSEE

J. H. Bonner & Sons

Memphis, Tenn.

Mills:
Jonquil and Ruffwood, Ark.

Manufacturers

Band Sawn Hardwood Lumber

Write or wire for prices on

Gum, Oak, Elm, Etc.

Frank Purcell Walnut Lumber Co.

Plenty of logs like the portion of our stock shown above have made possible the million and a half foot stock of well manufactured American Walnut Lumber which we now have to offer.

Prompt shipment
All grades and thicknesses
Guaranteed Inspection

12th AND BELT LINE

Kansas City - Kansas

SEE BEFORE YOU BUY

Samples of all Southern Hardwoods, showing Class of Stock, Texture and What you may Expect

Canadian Representative:
WILLIAM BARRATT,
413 Crawford St., Toronto, Ont.

Memphis Land & Lumber Co.

8th Floor, Central Bank Bldg. MEMPHIS, TENN.

"A Sample Car Will Convince You"

A name that should be on your inquiry list for Hardwood Lumber

American Column & Lumber Co.

Brunson Building, COLUMBUS, OHIO

—Manufacturers of—

West Virginia

Soft Yellow Poplar
Plain White Oak
Plain Red Oak
Quartered White Oak
White Oak Timbers and Plank

Chestnut	Butternut
Basswood	Ash
Maple	Cherry
Hickory	Walnut
Beech	Sycamore
Buckeye	Black Gum
Birch	Hemlock

Oak and Hardwood Dimension Stock

Steele & Hibbard Lumber Co.

ST. LOUIS, MO.

56 Years in Business

We carry a large stock of dry

Hardwood Lumber

25 Different Kinds
Quick Shipment
Write or wire for Prices

We specialize Oak cut from Mild Texture Missouri Timber with thin sap both plain and quarter sawed.

We ship also from Sawmills direct ; Red as well as Sap Gum and Poplar both plain and quarter sawed, Sound Wormy Chestnut, Cypress and Ash.

"Wire collect for prices or other information. Time is Money, delays pay no dividend."

WAYNE LUMBER CO.

Manufacturers and Wholesalers

Canadian Hardwoods

- - BIRCH AND MAPLE - -

OUR SPECIALTY

Elm, Ash, Basswood, Beech, Chestnut, Oak, and Poplar

110 West 40th St. New York

Canadian Representative,
D. Cote, 730A Champagneur, Outremont, Montreal

Band Sawn West Virginia Hardwoods

Our timber, of virgin growth in Greenbrier and Pocahontas Counties, limestone soil, gives a combination of Texture, Quality and Character that is most desirable to the Woodworking trade.

The most critical Hardwood users are among our best accounts. Why?

The W. C. Barlett Lumber Co.
Charleston, W. Va.

A "Quality" you will admire
A "Service" you will appreciate

We have the facilities for giving Canadian Woodworkers and Furniture Manufacturers a prompt service on straight or mixed cars of the following:

Ash, Oak, Gum, Poplar, Hickory, Walnut, Chestnut, Beech, Maple, Elm, Sycamore, Cottonwood.

Soft textured Plain and finely figured Quarter-Sawn Red and White Oak our specialty .

J. V. Stimson & Company
OWENSBORO - KENTUCKY
Bandmills: Owensboro; Campbellsville, Kentucky

D. E. Hewit Lumber Co.

Huntington, W. Va.

MANUFACTURERS

West Virginia Hardwoods

(Not Better than the Best but as Good as the Best)

FAS Plain White and Red Oak
No. 1 Com. Plain White and Red Oak
Implement Oak
Sound Wormy Chestnut
No. 1 Common and Better Chestnut
Hickory Plank
Poplar and Basswood

St. Francis Basin Hardwoods

Kraetzer Cured and Air Dried

Tennessee Aromatic Red Cedar

Carloads and less or mixed with Hardwoods

"What Others Say"

"Your letter of February 15th received and we want to say that this was a very nice lot of lumber. It was good widths and lengths and well manufactured, dry stock and the grading was very liberal. We are sorry we cannot use more of this lumber at the present time. *We received several cars from other manufacturers at a cheaper price but the lumber was not nearly as satisfactory.* When we are in need of more stock we will take the matter up with you."

(Note—The above was sent us February 24, 1921 unsolicited. Name given on application).

GEO. C. BROWN & COMPANY

Home Office - MEMPHIS, TENN.

BAND MILLS, PROCTOR, ARK. CROOKED BAYOU, ARK.

The Arrow Lumber Co.

Manufacturers and Wholesalers of
West Virginia
Hardwoods and White Pine

Oak Timbers Our Specialty

PARKERSBURG, W. VA.
Mills: Raleigh, W. Va. Natural Well, Va.

McLEAN MAHOGANY & CEDAR CO., INC.

American Hardwoods

WE SOLICIT YOUR ENQUIRIES

742 Ellicott Square, Buffalo, N.Y.

Yellow Poplar Lumber Co.

Manufacturers of Band Sawed

Poplar Plain Oak
Quartered Oak
Chestnut Basswood

Capacity 50,000,000 per annum

SPECIALTY: Monogram Brand Oak Flooring

CANADIAN ENQUIRIES SOLICITED

COAL GROVE, OHIO, U. S. A.

Tennessee Lumber & Coal Company

Manufacturers and Wholesalers

APPALACHIAN HARDWOODS

Soft Textured White and Red Oak, Poplar, Chestnut, Southern Gum

OAK TIMBERS AND PLANKING CUT TO ORDER

Band Mills: Verdun, Tenn., Louvain, Tenn. Submit your enquiries to our Sales office, Cincinnati, Ohio

"Hartzell's Choice Walnut"

The way Walnut comes to us

COMING AND GOING

One constant stream of American Black Walnut from "Stump to Consumer" flowing through a steady, reliable and satisfactory channel.

"Geo. W. Hartzell"

Logs in the rough coming in Veneers and Lumber of the highest quality going out daily year in and year out covering a period of 35 years.

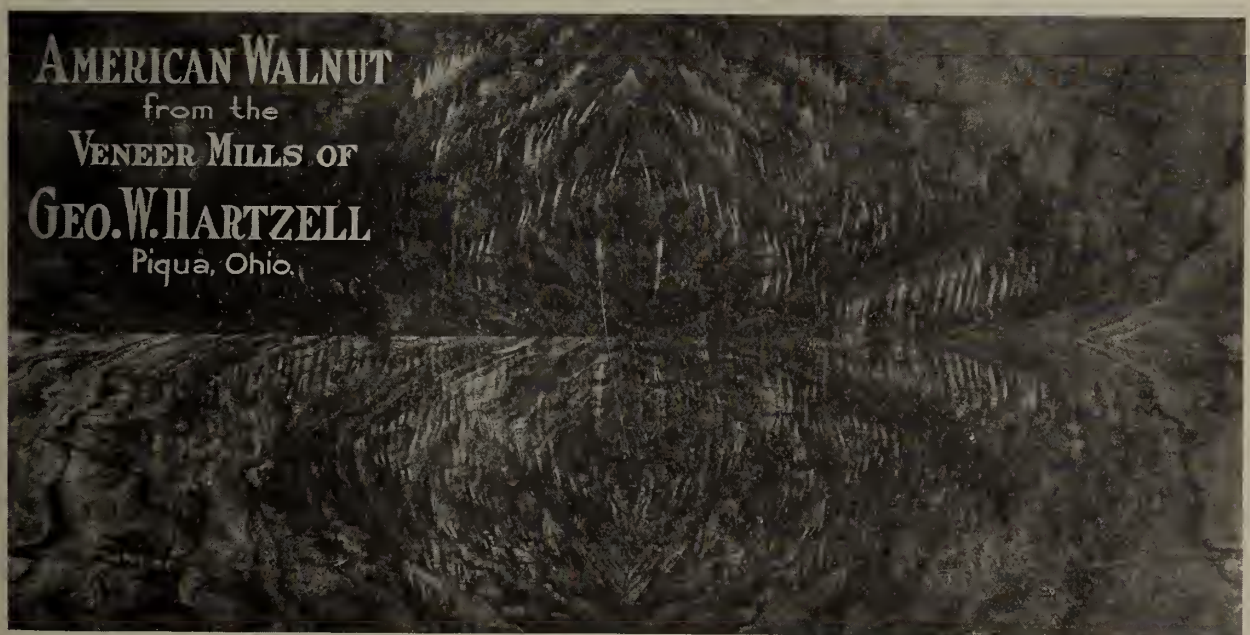
We rightfully claim your patronage because of "SERVICE and QUALITY," if there is any question in your mind about it

"Try Us and We Will Ship You the Convincer"

No Order too large, no Order too small to receive the close and careful attention it is our custom to give. That is a great part of our business, serving our customers.

"WRITE FOR SAMPLES AND QUOTATIONS"

Geo. W. Hartzell - Piqua, Ohio



The way it goes to our Customers

High Grade White Hickory

Why Pay High Freights on Waste Material? Stock sawed free and clear of defects to specified sizes. Waste eliminated at source. Operating numerous Mills throughout the choicest HARDWOOD BELTS in the United States.

"Buttcutt" Brand

Hickory, Oak and Ash

DIMENSION STOCK

Ski Billets, Picking Sticks, Hockey Sticks, Coupling Rods, Handle Blanks, Furniture Stock, Dowel Blanks, Rim Strips, Spoke Blanks, Shaft and Pole Stock, Gear Woods, Vehicles and Motor Woods for Bending Purposes.

Brown Brothers Company
MANUFACTURERS
11 Broadway - New York

The BRAND of QUALITY

Bigelow HARDWOOD PRODUCTS

The SYMBOL of SERVICE

A Complete Stock of Assorted Grades and Thicknesses

NORTHERN HARDWOODS

ASH, BEECH, BIRCH, BASSWOOD
SOFT ELM, ROCK ELM, HARD MAPLE

THE BIGELOW-COOPER CO.

BAY CITY - - MICHIGAN

American Hardwood Lumber Co.

St. Louis, Mo.

Large stock of—

Dry Ash, Quartered Oak Plain Oak and Gum

Shipments from — NASHVILLE, Tenn., NEW ORLEANS, La., and BENTON, Ark.

Dowels, Turnings, Knobs, Spindles, Buttons, Drawer Stops, Table Pins, Screwhole Plugs. Special Woodwork to order.

No 2 Dowel Pin

HENRY ROWE MFG. COMPANY NEWAYGO, Mich.

Indiana

Quartered Red and White

OAK

1,000,000 feet of dry stock carried at all times

ALSO PLAIN OAK AND ASH

We manufacture all stock carried

Evansville Band Mill Co.

FRANK M. CUTSINGER, Pres.
GEO. H. FOOTE, Vice-Pres. & Treas.
JOSEPH WALTMAN, Secretary

Mills at EVANSVILLE, Indiana

Upham & Walsh Inc.

Throop St. South of 22nd St.

Chicago

Northern and Southern Hardwoods

We make a Specialty of

Oak, Gum, Elm, Maple Birch and Basswood.

We solicit your inquiries regarding lumber of any kind

L. D. MURRELLE LUMBER COMPANY

BAND MILL : BUDE, MISS.

General Sales Offices : 1524 Exchange Building, Memphis, Tenn.

A few Specials :

130,000 ft. 4-4" No. 1 and No. 2 Com. Qtrd. White Oak
85,000 ft. 4-4" No. 1 and No. 2 Com. Qtrd. Red Oak
100,000 ft. 4-4 No. 1 and No. 2 Com. Plain Red Oak

Manufacturers of White and Red Oak, Poplar, Gum, Ash, Magnolia and Beech

We Specialize in Quartered WHITE OAK and POPLAR

Highest Quality

St. Francis Basin Hardwoods

Band Sawmill - Marmaduke, Ark.

SAH
OAK
GUM
CYPRESS
TUPELO
SOFT MAPLE

The Vail Cooperage Co.

General Office - FORT WAYNE, Ind.

OUR EXPORT BRAND

Service **LHC** *Quality*

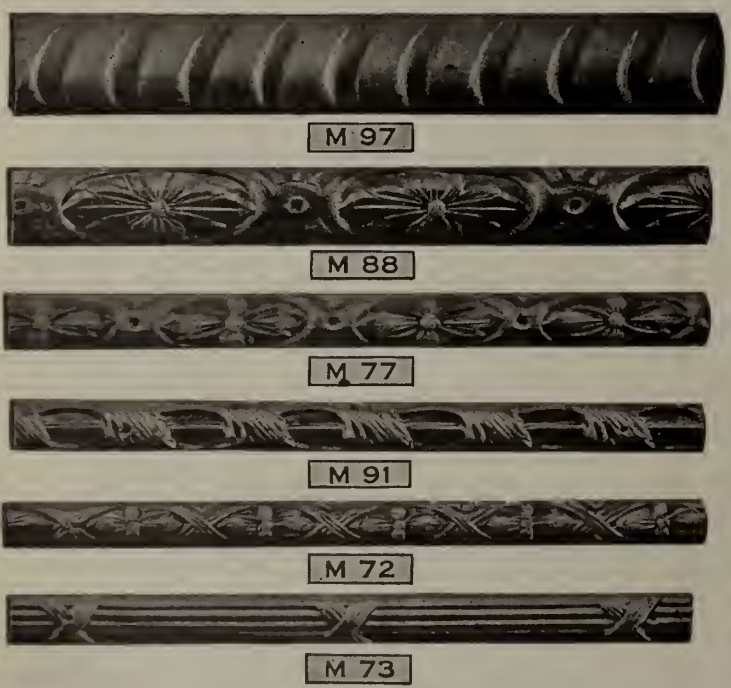
Prompt **SPECIAL**
Plain White Oak
50 M' 1" FAS
30 M' 1¼" FAS
12 M' 1½" FAS
15 M' 2" FAS

Shipments **SPECIAL**
Plain White Oak
70 M' 1" No.1 C&S
20 M' 1¼" No.1 C&S
20 M' 1½" No.1 C&S
15 M' 2" No.1 C&S

GUM
ASH
OAK
POPLAR
CHESTNUT

LIVERPOOL HARDWOOD COMPANY Inc.

50 Church St. NEW YORK CITY
Bank of Commerce Bldg. MEMPHIS, TENN.



MOULDINGS We are making more Period Mouldings than ever before. Orders should be placed early to assure your supply when needed.

KNOBS The Period Knobs we placed on the market a few months ago are proving very popular. If you have not received samples ask for them now.

ROSETTES A new Period item to accompany the knobs.

Waddell Manufacturing Company

Coldbrook and Taylor, N. W. Grand Rapids, Mich.

MAHOGANY, WALNUT

LUMBER and VENEER

Poplar Veneer

Quartered Oak Veneer

Loading Mexican Mahogany Logs in the Tropics.

DROP US A LINE WHEN NEXT IN THE MARKET

Lewis Thompson & Co., Inc. - **Colonial Trust Building, Philadelphia, Penn.**

Warerooms: Astoria, L.I., High Point, N.C.

Yards: Astoria, L.I., New Orleans, La.; Philadelphia, Pa.

E. R. Spotswood & Son

INCORPORATED

MANUFACTURERS OF

Kentucky Hardwood Lumber

We specialize in soft texture Kentucky Oak—Plain and Quarter Sawed, also in Ash, Basswood, Chestnut, Poplar, Beech.

Let us quote you on your requirements—our prices are right and we can make prompt shipments direct from our mills.

LEXINGTON - - KENTUCKY

Burns & Knapp Lumber Co.

Manufacturers of

Southern Hardwoods

Plain White and Red Oak, Dimension Oak, Hickory, Ash, Chestnut, Poplar, Basswood, Walnut, Maple, Beech, Butternut.

CONNEAUTVILLE,——————— —PA.

We list below, items of our own manufacture, band sawn, that we are in a position to ship promptly.

1/2", 5/8, 3/4, 4/4, 5/4, 6/4 & 8/4 Quartered White Oak

3/4, 4/4, 5/4 & 6/4 Qtd. Red Oak

5/8, 3/4, 4/4, 5/4, 6/4 & 8/4 Plain Oak

4/4, 5/4, 6/4, & 8/4 Sound Wormy Oak

5/8, 4/4, 5/4 & 6/4 Plain Sap Gum

4, 5, 6, 8, 10 & 12/4 Qtd. Sap Gum

4, 5 & 6/4 Plain Red Gum.

4, 5, 6, 8, 10 & 12/4 Qtd. Red Gum

4, 5, 6 & 8/4 Tupelo Gum.

5/8, 4, 5, 10 & 12/4 Ash.

5/8, 4, 5, 6, 8, 10 & 12/4 Elm.

5/8, 10 & 12/4 Maple.

4, 5 & 6/4 Cottonwood.

MAY BROTHERS Office and Band Mills: MEMPHIS, TENNESSEE

UP FROM THE TROPICS SUPREME AMONG WOODS

MAHOGANY

Tabasco, Laguna, Honduras and Mexican Mahogany

Out from the tropical interior, along steaming jungle paths and down long rivers to the sea, the history of OTIS mahogany can be traced. Virgin forests yield their treasures to the enterprising white man and natives do his bidding as he seeks and hews the timber so valued in the north land. Thus mahogany in quantities to satisfy the largest buyer comes to our yards. Twelve million feet per year is our capacity, and assures you of prompt service. Write for our prices to-day.

ESTABLISHED 1867 OTIS TRADE MARK INCORPORATED 1886

Otis Manufacturing Company

Peters Avenue and The River

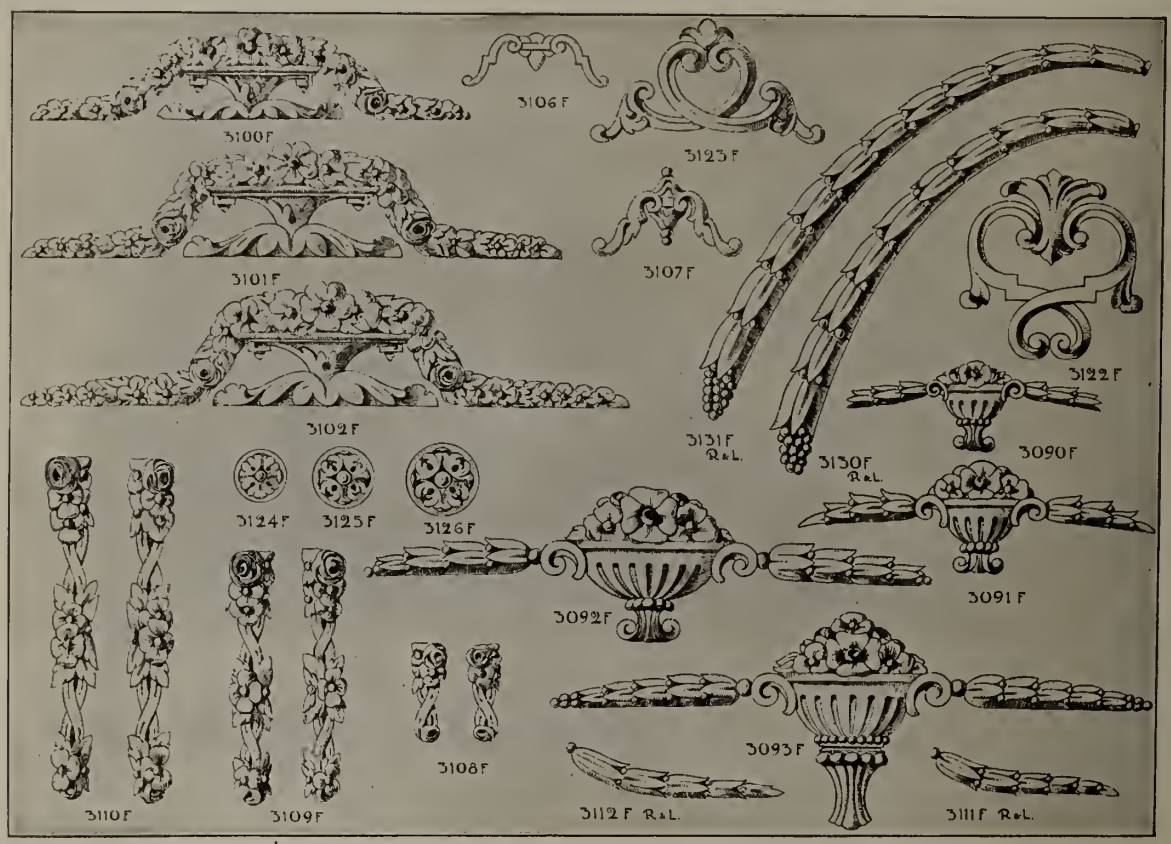
NEW ORLEANS, LA.

Chicago Office: Room 208, 128 N. Wells Street

PERIOD CARVINGS

for

FURNITURE



Largest Manufacturers of Imitation Wood Carvings in the World
Quality the Best — Prompt Shipment

Unlimited facilities for the manufacturing of high grade period wood carvings in composition and wood fibre. Reproductions of exclusive designs our specialty.

CATALOGUE SENT ON REQUEST

THE DECORATORS SUPPLY COMPANY

ARCHER, LEO AND LIME STREETS
CHICAGO

QUALITY

THE highest quality in Southern Hardwoods best identifies the products of the Memphis Band Mill Co.
If you are in the market for Oak, Red and Sap Gum, Poplar, or any other Southern Hardwood, you can be assured of the choicest stock on the market if you place an order with us.

Memphis Band Mill Co.
"Quarter-Sawn White Oak Headquarters"
Memphis, Tenn. - U. S. A.

Efficiency Marks Every Step of Our Service to You

Exact photograph of alley in our yard

White and Red Oak

Plain & Quarter Sawed Red Gum

Our Specialty Quarter Sawed Red Gum in Plain and Figured Wood

From the cutting to the delivery to your hands, our entire stock receives the most careful attention. All the excellence of quality and the beauty of the wood is kept just as it is when cut. When next you are in need of Oak, Ash, Elm, and Cypress of first class quality and in perfect condition write us. We can ship promptly.

BARR-HOLADAY LUMBER CO.

BAND MILL AT LOUISE, MISS. GREENFIELD, OHIO

WIS

This yard was BUILT for perfect drying. The appearance of the piles will convince every man who knows hardwood lumber.

Lumber Can't Be ALWAYS Good Without Perfect Piling

The *correct* drying of hardwood lumber is a science based on definite formulae. Recognizing this, our yard was ***built*** to insure the most perfect possible drying.

Everyone familiar with lumber will recognize what the appearance of the piles in the accompanying photograph means. They are your guarantee of flat, straight, clean lumber.

Our list includes the standard species and grades of southern hardwoods with NOTHING PICKED OUT, and has behind it a comprehensive and conscientious desire to give the customer his full measure of value and service,

Wisconsin Lumber Company

Chicago, Illinois

BAND MILLS, DEERING, MO.

SOUTHERN HARDWOODS

Unexcelled Quality and Service

Prompt Shipment — Dry Stock — Uniform Quality and Inspection
Band Sawn and End Trimmed — Full and Uniform Thickness — Good Run of Widths and Lengths

Twenty-five years of service to the most exacting users of quality hardwoods enables Paepcke Leicht to help you get your exact requirements in southern hardwoods no matter what they may be.

This experienced service is impartial,—its purpose is to help you select the wood best suited for your use—uniform in quality and of the most economical grade which will prove entirely satisfactory for the job.

We Specialize in Oak and Gum

PAEPCKE LEICHT LUMBER COMPANY

GENERAL OFFICES—Conway Building
111 West Washington Street, Chicago, Ill.

BAND MILLS—Helena, Ark., Blytheville, Ark.
Greenville, Miss.

"CHICAGO MILL"
DIMENSION STOCK
From SOUTHERN HARDWOOD LUMBER

OUR CAIRO, ILL., PLANT LARGEST IN OPERATION
Exclusively engaged in the manufacture of DIMENSION STOCK (Kiln Dried or Air Dried)

Dimension Lumber Kiln Dried Means:

1. The elimination of waste.
2. A saving of at least 40% in freight.
3. Lumber delivered at the woodworker's plant ready for immediate use.
4. A quick turnover and minimum investment in lumber.

The benefits to be derived from the use of Chicago Mill Dimension Lumber are cumulative. In the long run it means lower production cost for the finished article.

For particulars and prices address

Chicago Mill and Lumber Company

FROM
Sycamore
Ash, Elm
Oak, Gum
Cottonwood
Cypress, Maple

Dimension Lumber Department
111 WEST WASHINGTON STREET
CHICAGO, ILLINOIS

FOR
Furniture
Automobiles
Drawer Sides
Kitchen Cabinets
Garment Hangers

Suppose You Were Making a Very Fine Period Suite, or Perhaps a Phonograph Period Model

This sort of a piece absolutely deserves trimming that is attractive and correct

LET US SEND SAMPLES

F2-4141

WRITE FOR PRICES

WE MAKE IT—and everything else in the Hardware line

WEBER-KNAPP CO., Jamestown, N.Y.

ESTABLISHED 1892 INCORPORATED 1916

ROBT. BURY & CO., Canada

LIMITED

1 Spadina Avenue, Toronto

Special Announcement to the Trade

We are now acting as Distributing Agents in Canada for the ***Waterville Veneer and Panel Company, Waterville, Quebec.*** The new plant is now fully equipped with three lathes and can turn out Rotary Cut Veneers up to ten feet long. The panel plant is one of the Best on the Continent, waterproof glue only being used in the manufacture of the ply wood. Panels can be supplied in any wood with Mahogany, Walnut and Oak faces. The Company will also specialize in a cheap 3-ply Panel built of Birch and will also make a specialty of Single Ply Veneers in Birch, Basswood, etc., cut to dimension.

Mail your enquiries to above address

Head Office and Veneer Warehouse
1 Spadina Avenue, TORONTO

Lumber Yard, Dry Kilns and Mill
Foot Spadina Ave., TORONTO

EASTERN BRANCH— 55 ST. FRANCIS XAVIER STREET, MONTREAL

CANADIAN WOODWORKER and Furniture Manufacturer

A Monthly Publication of Trade News and Practical Information, reaching the factories producing Interior Finish, Doors, Sash, Flooring, Boxes, Aeroplanes, Furniture, Pianos, etc.

Woodworker Publishing Company, Limited
345 Adelaide Street West - - - - - - TORONTO
Branches:
Montreal, Winnipeg, Vancouver, New York, Chicago.
Subscription, $2.00 a year; foreign, $2.50.

Authorized by the Postmaster General for Canada, for transmission as second class matter.

Vol. 21 Toronto, July, 1921 No. 7

Preparing For Better Business

The furniture manufacturers of Canada are taking advantage of the usual midsummer lull to prepare for the improved conditions which they believe they will face early in the fall. At the present time the semi-annual price lists are being distributed among the trade. These new prices have been carefully figured at present replacement values, and as the overhead or burden was based on normal productiveness, they represent the lowest prices permissable under existing conditions. The reductions vary with the different lines, some showing a drop of 15 per cent. over the prices found in the March lists. Taken on the average, the wholesale price of furniture has eased off about 30 per cent. from the peak of 1920.

A new departure—one that should have a very beneficial effect—is to be found in the guaranteeing of the quotations presented in the July lists against a decline for a period of six months, or until the end of the year. The manufacturers were practically unanimous in their willingness to take this step. This means that the retailer can depend that the new values will prevail for the balance of the year. The effect of this should be to restore the confidence of the furniture dealers and cause them to enter the market and buy on something more nearly approaching a normal basis. Trade has suffered for the lack of a steadying influence, and it is thought that this price guarantee will have the desired result.

In the retail field the demand for furniture was held up in a very gratifying manner. Some of the furniture merchants report that the volume of business for the first six months of 1921 was equal to that for the corresponding period of 1920, and in a few instances 1921 shows a slight increase. In view of this, one may wonder why the manufacturing end of the industry is suffering from a lack of orders, so much so that production is away below normal. Two explanations are given for this state of affairs; one is that the dealers were over-stocked at the beginning of the year and have been busily engaged in reducing this surplus, and the other is that owing to the general air of uncertainty so prevalent in industrial and commercial circles, they have permitted their stock to become badly depleted. In view of this it is difficult to see how the dealers can remain out of the market for any prolonged period. It is hoped that the guarantee which is embodied in the new lists, together with the fact that prices have been cut to the last notch, will convince them that the present is a good time in which to commence buying, on a moderate scale at least.

In figuring overhead on a normal basis, the furniture men have fallen in line with the suggestions offered by different well-known business experts. When business is good and production above normal, the overhead is low. As the demand drops and production declines, the overhead mounts. By figuring the burden on a normal production basis, a surplus would be built up during good times that would take care of the deficit which would accrue when production is low. The result would tend toward normal business, for prices would not show such a wide variation from time to time.

In the present instance the furniture manufacturers who are operating below normal are taking a loss on their overhead account, which will in some instances wipe out all profit on the sales made. In the long run the effect cannot help but be beneficial to all concerned, as it will tend to stabilize values at practically a normal level, resulting in a normal resumption of business.

The opinion is held by many manufacturers that before the six months' guarantee period has passed furniture values will tend to stiffen. Prices of certain grades of lumber are showing signs of firming ,while glass is on the upward trend. In the glass industry all indications point to higher values. As furniture prices are based on rock bottom costs, with profits shaved to the last cent and all material figured at replacement values, any increases which may take place in the raw material market must be reflected in the sales price. The guarantee against further decline does not prevent prices being increased during the period covered, if found necessary.

One reason why the retail business has held up so well is that the publicity efforts of the bedding manufacturers, as exemplified by Simmons, Limited, the Gold Medal Furniture Manufacturing Co., and others, has created a strong demand for bedding. This is another reason why the furniture makers look toward fall with a fair degree of optimism. It is felt that the general publicity campaign which the Home Furnishings Bureau is planning to launch in the near future will not be without its effect.

Advertising Campaign Taking Shape

American Furniture Men Getting Down to Business — Put New Life Into the Industry — Z. G. Simmons Delivers Some Plain Truths

The third meeting of the executive committee of the Furniture Publicity Bureau was held at the Blackstone Hotel, Chicago, on June 10. After considering reports of investigations made since the previous meeting, the committee determined upon the basis of yearly assessment on which the manufacturers of furniture will be asked to pledge for three years. The retailers of furniture will also be canvassed to pledge for three years an amount in line with their output.

These pledges will be issued immediately to manufacturers and retailers and a business agent engaged to conduct the work of securing signatures to those pledges as rapidly as possible. During the July market meetings will be held both in Grand Rapids and Chicago to feature the work of publicity and the necessity for securing funds to carry out the work on a basis which will be acceptable to the furniture industry. As soon as the manufacturers and retailers of furniture have demonstrated their willingness to support a movement which will in the broadest and highest sense possible create an appreciation of the American home, the machinery will be put in operation for educating the manufacturer salesman, the retailer salesman and the public as to the essentialness of furniture.

At the organization meeting, which was held earlier in the year, Z. G. Simmons of Simmons, Limited, was called upon for an informal talk. Mr. Simmons struck out straight from the shoulder. The points brought out and emphasized and the breadth of vision and aggressiveness shown make his address well worth reproducing. His message was as follows:

Need More Backbone.

"I don't know what to say about this thing unless I speak what I think. My own impression is (and I count myself in, so I don't want anybody to take offense at anything I say), that we are about the cheapest cheap-skates in any large industry in America today; that we absolutely lack vision and "guts"; that we have got the most important thing to deal with of anything that concerns the human family, except its food and possibly its clothing; that we have made a miserable record in producing rotten stuff over a period of years—and that can be almost generally applied. Now, remember, I count myself in that. The stuff we have made up in comparatively recent years I am ashamed of; and I'm ashamed of every single piece and I wouldn't have one of those pieces in my house. I have seen stuff from the Karpen Company that I'd run into Canada to get away from, and yet we expect the American public to patronize us, give us its money and have a continuing, growing business.

"If we had one-tenth of the "guts" that these automobile pirates have there would be few long faces in this "bunch." It struck me, in thinking this thing over after I came out of the blue sky in October last year and got part way back to earth and found what a debauch I had been off on, that as a class we are a lot of peaches—pikers. I don't know what this scheme is here. I haven't been in on it, but if you are going to sell American people back to the old idea that home is the cradle and the foundation of our modern civilization, you have got the finest thing in the world to sell them and we wouldn't have half enough furniture factories in the United States of America to make the products they want if we could restore the home to where it used to be. (Applause.) Things are pretty bad when they will mortgage their home to buy an automobile, when they will take their life insurance policies and forfeit them to buy an automobile. I happen to be a trustee of a life insurance company up in Milwaukee, and they have got about $450,000,000 assets, and I think they have about $75,000,000 loaned on policies—absolutely defeating the very object of a life insurance policy—and more than 75 per cent. of the $75,000,000 was to buy automobiles.

"Just think of those automobile fellows having "guts" enough to hire Madison Square Garden year in and year out, and coming down here and taking this barn they call the Coliseum and putting on a show and charging you to go in and see the stuff they are going to sell you and making you pay cash for the darn stuff! I will make the prediction now that they will be the means of leading us back into a fairly good business this fall. Who would imagine that the day had come when that business which has prostituted every principle of common, decent business, would be the means of taking the rest of the business of this country onto a fair plane of activity.

Proper Spirit Will Do It.

"When the armistice was signed we had cramps and began to get sour in the face and worried and thought the game was up. The automobile dealers said, 'Hell! By spring we won't be able to fill your orders,' and by spring they were not able to fill the orders, and they are now telling us that if we don't hurry up and buy a car we won't get it, and yet we all know there are so many manufacturers and such great production that it seems utterly impossible for only this nation, but the whole world to take their products off their hands. But they don't think so, and they go out and persuade the American public so it don't think so, and they do business all the time.

"The great furniture industry, the greatest industry in America, should contribute to the making of attractive homes, and we, as Americans, especially those of us that are here, want our fellow-men to live on a better plane; if we don't, the lake is out here to jump in and we might as well get in now as later. We want their children educated, we want this great commonwealth to go into a higher, better sphere, into higher, better things—all of us do. And the cradle, the place where the world begins, the foundation of that kind of citizenship is made and laid in the home—the answer to all the 'isms' that have been worked up in the last ten or fifteen years, and God knows there have been enough of them. That concerns us; that is our line of business and we ought to play it up, not down. We are going to refuse to make certain merchandise we can sell at a profit because we know the darn stuff is no good. We are going to try to make our products better and better and better. We have got to be dissatisfied with everything—with every single solitary thing we produce and produce it better. Nobody ever went

wrong trying to make a thing better. He has gone wrong when he tried to make a thing worse.

Advertise an Ideal.

"I don't believe you will get anywhere with an advertising campaign that concers the sale, specifically, of anybody's product. I think if we could be big enough (I don't know that we can be) to go out on a program that sets an ideal, and create the demand on the part of the husband and wife and children to have a better home, then everything else would follow. If you could sell the husband and wife—the husband who works in the shop—with the idea that they must fix up their little home, a great deal of the trouble that has been brewing would be eliminated and the job would be done.

"It is a pretty hard problem to get a hard-headed business man to put up a lot of money to sell an ideal without a direct connection as to whether he is going to sell a bed or something of that kind and get his profit yet I believe that any advertising scheme you sought to put forward that didn't encompass in its fundamental principle the welfare of the public would not get anywhere.

"I don't think we can tackle the hall the dining-room the kitchen, or any other particular room. I think we have got to create in the minds of a great mass of people that they want to fix up their homes.

Spend One Million Selling Sleep.

"I have heard some discussion here about a half million dollars. Well, our firm is a little bit of a spot in this great industry, and we expect to spend twice that amount of money on our own business alone. We have made our advertising, as some of you have noticed, rather general. We have talked about sleep.

"We were advertising a certain number or style of a certain bed—something we made—and I ran into a fellow who said: 'You're a fine specimen, you are! You've been talking about the labor problem and Lord knows what all. Why don't you apply those same things you are talking about now to your own business?' I said: 'We do.' He said: 'You don't.' We were in the Waldorf cafe, and we had had several and were sitting there talking things over. There were as many men as there are in this room drilling into dinner, and he said to me: 'Now, how many people are there in this room?' I made a guess. He said: 'You have got something they have all got to have. Why don't you sell them that?' I said: 'What's that?' He said: 'Sleep.' I said: 'You put your finger on it. What's your business?' He said, 'I'm an advertising man.' I said, 'What's your proposition and what's your price?' He said: 'Well, it's a little peculiar. I take a retainer fee.' I said: 'Well, what's your price.' He said: 'I don't understand. If you mean what will I take you over for and take charge of the advertising for, I'll do it for $25,000 the first year.' I said: 'Here, you write out your plan while I go out and get a telegraph blank and discharge the people we have already got.' I went out and sent the telegram, and when I came back he had his proposition written out, and I signed across it, and we have been trying to convert a lot of people around this country that sleep plays an important part in their lives, and it hasn't hurt us a darned bit, I'll assure you, if somebody else has sold a few articles of sleep, because we have sold so darn many more. The month of March was the largest month in our history. We haven't heard one word about price, with the exception of one customer out of 14,000 customers on our books. Think of it! And there we are in an American-manufactured panic without any excuse for it, but we have got it and somebody is talking deflation and normalcy and liquidation, and God knows what all, and we are not bothered with the word 'price.' We make a competitive article, too. I stand here and tell you that in days gone by we have made as high as 100,000 beds in a year and sold them at a loss of 25 cents to 50 cents a bed because we had an idea we had to have a leader. Now we aren't making a doggone thing that hasn't got a full, fair profit, and we are not going to, either. Furthermore, the people that buy are product want it. We have made more money and they can make more money, and the American public is not interested in price, it is interested in value.

"As one member of this great industry, I would like to see it take a new birth. I would like to see the men in this industry visualize it on a very high plane. I would like to be a party to a great propaganda to sell the American home back to the American people and take our chances with what we put in it, but we have to set high standards of good merchandise, well-designed, well-finished, and then we would be on a permanent basis and we would not have to apologize to any other industry in America."

RAILROADS KEY TO SITUATION.

W. M. Ritter of the W. M. Ritter Lumber Co., Columbus, Ohio, has been in Washington, D.C., recently, working with Government officials and railroad executives in an endeavor to devise a plan that will tend to improve present conditions.

Mr. Ritter believes that the railroads are the key to the industrial situation, that there is nohing which will so quickly improve industrial conditions as the inauguration of a comprehensive buying compaign by the various railroad companies. Such a campaign would be the definite beginning of a prosperous era. He says in part that the railroads are the natural and logical buyers to start business, as they purchase normally about 35 per cent. of the production of a private industry. Before this can be brought about funds must be provided. For this reason an immediate and liberal settlement of the Governments obligations to the railroads should be effected. He further adds that there should be no thought at the present time of reducing freight rates. The question of rate adjustment should not be agitated until the railroads are in sounder shape and then rate structures should be scientifically worked out with a view to conserving industry, increasing tonnage and producing a greater net return.

If the railroads were in a position to enter the market there is no telling how far-reaching the results might be. The psychology of the buying circle is not clearly understood by the average mind. Buying begets buying. What is the finished product for one is the raw material for another, and the producer of the raw material is the ultimate consumers of the refabricated article, and so the process continues in an endless circle of activity—when transactions are taking place and industries functioning normally.

It has been estimated that the use by the railroads of $500,000,000 in paying debts and making purchases in order to meet ordinary requirements, would result in clearing transactions aggregating a total of over $5,000,000,000.

Eight of the ten different styles of houses in the development of the Border Housing Co. at Walkerville, Ont. Monotony of design has been successfully eliminated without sacrificing economical standardization.

A House Every Twelve Hours

Ambitious Building Scheme Completed at Walkerville, Ont. — One Hundred Houses Completed in 150 Days — How Standardization Was Used to Excellent Advantage

During the spring and summer of 1920 the large industrial plants situated in and adjacent to Walkerville, Ontario, experienced considerable difficulty in retaining the married men in their employ on account of the acute shortage in the Border Cities, of suitable houses to rent, or even to buy, on terms within the reach of the average mechanic's means. To overcome this undesirable state of affairs, which materially effected the efficiency of their production, and in order to place within the reach of their employees an opportunity to secure desirable homes which could be purchased by payment of a small amount down, with fixed monthly payments afterwards, which monthly payments would be less than the current rents charged, the principal industry of Walkerville formed the Border Housing Company.

This company undertook the erection of one hundred houses in the town of Walkerville and operating through the Walkerville Housing Commission, under the Housing Act of 1920 secured the maximum amount of money allowable under the act, furnishing the balance of the money required themselves.

Standardization Without Monotony

It was the desire of the company, for the sake of economy, to standardize the houses as far as practicable and still if possible do away with the monotonous and undesirable appearance of group construction so common to projects of this kind where the same architectural features of exterior construction are used throughout. The plans finally decided upon called for a storey and a half house 23 ft. 6 in. by 30 ft. 9 in. with full basement and mass concrete foundation walls to ground elevation, integrally waterproofed. From grade to first floor and in some instances to first floor windows the exterior walls are either of brick or hollow concrete blocks, four different finishes to the concrete blocks being used, viz., rock faced cement, smooth cement, rock faced granite and smooth faced granite. The foundations in all cases have a waterable course at grade. From foundation to roof-plates, all walls are of solid construction, either brick or stucco on hollow terra cotta tile. The gables, where these occur, are studded, sheeted with one inch matched lumber, lathed and stuccoed in all cases. All roofs, excepting dormer roofs, are shingled with B. C. cedar shingles, 14 lb. asbestos paper being used under the shingles. The dormers are covered with three-ply prepared roofing.

The interiors are as shown by the plan, the same layout being common to the one hundred houses, which are plastered throughout and finished in clear B. C. fir. Ten different color schemes were used for interior painting and staining. Single pine floors were used for the ground floor and a rough floor only in the attic. The stair shown in the plan leads to an unfinished attic which has two and in some cases three windows. It is the intention of the company to let the purchaser convert the attic into one or two rooms as he so desires.

Ten Different Types

Ten different types of exterior elevations were used (ten of each type) and to further do away with too much uniformity even in each type seven different kinds of face brick were used, four different kinds of stucco, and fifteen different color schemes for exterior woodwork. By using different face brick, stucco, and color schemes and varying the appearance of the foundations as before mentioned, the ten houses in

each type were each subjected to a different architectural treatment and helped to impart to each house a certain individuality not possible, without making the cost prohibitive, if any other method had been used.

A contract for 100 houses was awarded the Russell-Navin Construction Co. and now the Russell Construction Co., Toronto. The contractors undertook

Showing houses in course of construction

the work upon the basis of actual cost plus a fixed sum for commission and supplying plant. The contract provided for a penalty to be collected by the company from the contractors if the final net cost, according to plans and specifications exceeded the estimate given by the contractors, and for a bonus to be paid by the company to the contractors if the final net cost was less than the estimate. In spite of the forty per cent. increase in freight rates, which materially increased the cost of material, the work was completed well within the estimate.

All material was purchased wholesale from the source of supply and all labor minimized by the use of machinery wherever possible. A small electrically driven saw and planing mill was erected by the contractors upon the property and equipped with three Elliot universal woodworkers, band saws, planers, and sander. All lumber of every description for interior and exterior use was cut to size and prepared for erection at the mill and then sent to the different houses ready for application, very little of anything but nailing being done in the field by the carpenters.

One House Every Twelve Hours

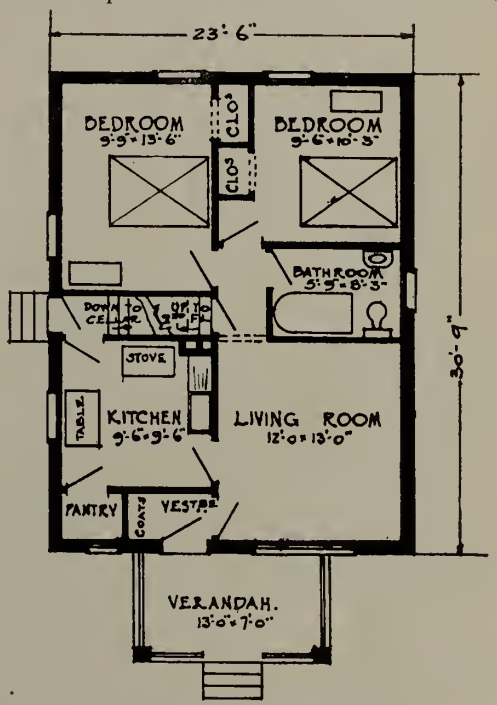
The work was well organized and the whole one hundred houses completed, with the exception of a little painting and grading which could not be done until the frost was out of the ground, in one hundred and fifty working days of eight hours each, or at the rate of one house every twelve working hours. No overtime whatever was put in by the field mechanics and very little by the millmen and unskilled workmen. When it is considered that the work was carried on throughout the winter months and practically all the material used had to be imported after the contract was let, causing delay in some cases, the brick coming from Chatham, Toronto and Montreal, the tile from Toronto and all lumber, lath, shingles, and interior finish from the Pacific Coast, the progress made was highly satisfactory.

These houses are being disposed of at $5,800 each, with small cash payments and very favorable terms. A person securing one of these homes would find that a monthly payment, which would not be as large as the current monthly rent for a house of this class, will carry the interest charges, pay taxes, etc., and reduce the amount standing against the house. It is understood that the net construction cost of the houses themselves, not including land, improvements, administrative and interest charges, is in the neighborhood of $4,050 each.

Contemplates Large Box Factory

H. C. Lake and associates, business men of Lake Charles, La., visited Victoria and Vancouver Island points recently to investigate the advisability of establishing a large box factory for export trade. The visitors investigated, particularly, the possibility of purchasing the required type of logs in an open and uncontrolled market and, should the logs be controlled by a loggers' agreement, the possibility of purchasing and operating their own timber limits. The trade to which these men would cater, would be the American and foreign demand for knocked-down boxes, shipped in car and ship loads. The woods considered best suited for this trade are spruce and hemlock. The visible end of the American supply of pine and other soft woods suited to box manufacture, and the fact that Vancouver Island has vast acres of such commercial timber as yet untouched are the main reasons which brought these gentlemen to Victoria.

Commissioner Thomson, of the Victoria and Island Development Association, who is responsible for the visit of the Americans, states that the securing of such a large factory as is contemplated would be one of the most important deals closed for a long time.



Layout standard floor plan

whether established at Victoria or some other island point. It is understood that the old Indian Reserve, the centre of industry in Victoria, is considered as probably the most suitable location. Mr. Thomson also announces that the Development Association is negotiating for the establishment of a factory to manufacture broom handles. This plant, it is proposed, would also be established on the Reserve.

Need Is For Trained Engineers

Woodworking Industry Has Not Made Progress Compatible With Its Importance — Many Big Problems Awaiting Satisfactory Solution — How Mechanical Engineers Could Relieve Situation

By Sern Madsen, Clinton, Iowa, Address before American Society of Mechanical Engineers

Like most other industries, woodworking is divided into two steps—primary and seeondary. The first deals with the production of raw materials and the second with the manufacturing of finished products from these materials. We may properly define these as lumbering and woodworking. It will not come within the scope of this paper to deal with both of these rather distinct and separate divisions. The engineer is equally essential to both of them, but we shall here consider his connection primarily with woodworking.

The lumbering and sawmill industries probably reflect the work of the engineer much more vividly. A modern sawmill is in every way as impressive and fascinating as any modern steel rolling mill. The engineering skill required in its design and operation should be less than that in any other large industry. The engineer quite naturally devotes his energies to the solution of the larger and more attractive problems. This may in part explain why in certain respects the lumbering industry has received more of his services than the ordinary woodworking plant.

Offers Unlimited Scope for Development.

To say that the woodworking industry is in a very primitive state of development is decidedly wrong, but we can truthfully say that it has not made the advancement becoming to an industry of its size. It has been estimated that in the United States alone the annual output of lumber would be sufficient to build seven separate plank walks each 25 feet wide and all extending from the earth to the moon. It has likewise been estimated that about 1½ million people earn their livelihood in the lumbering and woodworking industries. These illustrations help us to grasp the importance of woodworking. How can we explain the fact that so few engineers are engaged in this work?

It is but recently that agriculture, stock raising and some other large industries have begun to use scientific methods and to draw trained men from our colleges and universities. It is almost universally true that the older an industry is, the slower it is to adopt modern methods. The fact that it is old means that it has for centuries been esssential to man's existence. It means that the son has quite generally acquired skill in one or another of these industries from his father. It means that in the past it has been possible to conduct these essential industries with small plants, small capital, and a comparatively small amount of skill. Competition in the past has not been keen enough to require unusual effort, efficient equipment, or scientific knowledge in order to make a decent living or even become fairly successful in these trades.

Requires Intensive Effort.

During the last half century the woodworking industry has gradually developed newer and better methods and more efficient machinery, until it has now reached the point where we might say it requires intensive effort. Where in the past it has developed slowly under the old conditions it now requires the added help of applied science. Modern production methods so successful in other industries are being rapidly introduced in the woodworking industry, and it requires the aid of the engineer to apply them.

One should not get the idea that woodworking has not been influenced by the engineer. On every hand we have evidence of his handiwork, but its effects on the industry have generally come about indirectly For several years our government and some of our colleges have conducted scientific studies on the subject of lumber, its properties, uses, treatment, etc. The theory of drying, for example, is simple enough, but to carry out this simple theory is quite another problem. No two pieces of lumber are exactly alike; hence, in practice, we must deal with averages. It is one thing to make a laboratory test under the direction of a scientifically trained professor and quite a different thing to dry a large lot of heterogeneous lumber under the direction of the average dry kiln operator. In this field we are but partly reaping the benefits of scientific investigation due to difficulty in its fullest application to actual practice.

Compared With Metal-working Equipment.

The modern woodworking shop uses the same tools as developed in the average metal working shop. It is true that they are different—they must be different due to the nature of the materials, but the principles are the same. The greatest difference is in cutting speeds and feeds. Let us compare a few of the tools and processes

1. Sawing—Tools for this purpose are very similar, except for differences in size of teeth, temper, etc. The speed for metal is less than 100 feet per minute, while for wood we use as high as 8,000 feet per minute.
2. Planing and Surfacing—Tools used for metal have a more or less scraping cut. Parallels in woodworking tools are the carpenter's hand plane or a scraping tool or even a scraping machine.
3. Drilling—in drilling metals the peripheral speed of the drill is seldom over 40 feet per minute. In wood the bits may have a rim speed in excess of 500 feet per minute.
4. Milling—In metal cutting the milling head has a surface speed of less than 50 feet per minute. In woodworking the speeds may run as high as 10,000 feet per minute. By far the largest percentage of woodworking machinery performs its work by a milling operation.
5. Abrading—This process may be called grinding when applied to metals, but it usually consists of sandpapering when used on wood. The peripheral speeds of grinders and sanders at the cutting surface are approximately the same. There is, however, a great difference in the feed.
6. Turning—This process is very similar in both fields, except as to speeds.

In the development of machines in the above class. the mechanical engineer has devoted more of his time to those for working metals. His neighbors in the woodworking shop have patterned after his creations

with creditable results. It is often true that wood working machines may in some cases be crude but that is no reflection upon their designers. Metal working machines are usually designed by engineers who know and understand the work the machines must do. They have the knowledge and the facilities for producing the best to be had. On the other hand woodworking machinery has generally been conceived and designed by ingenious men in the shop. Lacking a thorough knowledge of machine design and facilities for building a machine the job is generally turned over to a machine shop. The usual result is a machine that works, but the chances for the success of that machine are decidedly less than for the more favored machine shop tool. These illustrations show how important it is that the woodworking industry should have in its employ mechanical engineers who may become thoroughly familiar with all the needs and requirements of each particular process or machine, and with the aid of their scientific training design and produce efficient equipment.

New Methods and New Machines.

In both the metal and woodworking industries we find so-called standardized machines. Standardization in woodworking machinery has not yet progressed very far. While some machines are standard, others are stereotyped. Designing has been largely handled by cut and try methods rather than by engineering knowledge. Certain details of construction developed 50 years ago are still blindly followed, though better construction is evident. Changes often are retarded by the mental inertia of older machine operators and older designers. An injection of new thought is needed to remedy this state of mind.

The trend of the times has brought about a need for more efficient woodworking machinery and at the same time there have been important developments in the engineering field that make great improvements possible. There are at least three factors that are at present tending to revolutionize woodworking machines. These are high speed steel, ball bearings, and the electric motor. Just as the development of high speed steel meant a re-designing of heavier and more efficient lathes and planers for metals, just so is it affecting woodworking equipment. It has increased planer feeds from 75 or 100 feet per minute up to as high as 300 feet per minute. At the same time delays due to necessary resharpening have been reduced. This increased speed has required larger and better bearings, heavier frames, and faster and better feed works. Sad to relate in this re-designing, the best of engineering practice has not always been used.

The average cutter head runs at from 3,000 to 4,000 R.P.M. and the bearing requirements are extremely severe. Lubrication presents another problem. Power loss is large in high speed poorly lubricated bearings Accuracy of adjustment is also difficult. Probably more different styles and types of bearings have been tried out on woodworking machines than in any one other industry. In nearly every case they have been found wanting. The old style plain babbited bearing has dominated the field, probably because it can more easily be renewed, rather than because of its virtues. Just now it seems that machinery manufacturers are trying to outdo each other in the adoption of ball-bearings. In many places these have proven themselves to be very satisfactory.

Until about 15 or 20 years ago practically every woodworking plant was belt-driven from a factory engine. When the polyphase induction motor was developed it began to replace the line shafts. The first practice was to use a motor for driving a group of machines on a short line shaft. This practice gradually gave way to individual motor drive, the motor usually being belted or directly connected to the main countershaft of the machine. The power savings due to elimination of belting and shafting and the convenience of individual motors greatly favored this type of installation.

In an effort to eliminate more belts and bearings the tendency in the last few years has been to connect the motors directly to the cutter head arbors. This construction often involves the use of as many as eight or nine motors on a single machine. At first couplings were used between the ends of the motor shaft and the cutter head arbor. Some problems of maintaining proper alignment were met and the present tendency seems to be to eliminate the coupling altogether and place the rotor of the motor directly on the cutter head arbor itself or conversely mount the heads directly upon the motor shaft. Here we again meet with bearing difficulties, and the ball-bearing is now used extensively. It will require a few years' experience to determine the wisdom of fallacy of this latest design.

We can thus see that woodworking machinery design is now being influenced more by current engineering practice than at any other time in its history. Already we have higher speeds, better bearings, and better methods of power application, necessitating more than ever the expert attention of the mechanical engineer in the modern woodworking plant. The present trend of design is to produce more efficient and better machinery. Along with this must come better operators and better mechanics. When any industry adopts the latest engineering practice, it must also adopt the engineer.

To be concluded in August issue

TO HANDLE LEATHERS AND BELTS.

The Mechanical Leathers, Limited, 126 Garden Ave., Toronto, has been appointed Canadian representatives for the Chicago Rawhide Mfg. Co. of Chicago, Ill. This company has been but recently organized. R. W. Coleman, the president, is a Virginian by birth, but has lived in Canada for many years. He has had considerable experience in this field, having been belt and sales engineer for the Chicago Rawhide Mfg. Co. for a long period. H. R. Alley, the secretary-treasurer, is a Toronto man, a graduate of the University of Toronto and of Osgoode Hall. He was overseas with the 3rd Battalion and the First Contingent and served with that unit until severely wounded in the Somme fighting. Upon his return to Canada he entered the sales department of the Goodyear Tire & Rubber Co., where he remained until joining the organization of the Mechanical Leathers, Limited.

The new company is carrying a stock of belts, belt lacing, rawhide gears and high-grade upholstery grains in their Toronto warehouse. A line of imitation leathers is also being handled.

It may be of interest to note that the products of the Chicago Rawhide Mfg. Co. are produced on a quality basis. Their leathers are cured by a slow process and no acids, barks or chemicals being used in their cure. It is claimed that this method greatly increases the strength and flexibility of the leather, tending to reduce slippage in belts and to prolong their life.

A Study in Millwork Costs

Results Must be Accurate to be Valuable — Data Gathered From Books of Different Canadian Plants — How Do These Figures Compare with Yours?

Millwork costs was one of the main topics for discussion at the meeting of the Southwestern Ontario Retail Lumber Dealers' Association held recently at Chatham, Ontario. A committee, consisting of M. R. Bogart, Chatham, L. H. Richards, Sarnia, John T. Wallace, London, and B. F. Clarke, Glencoe, had been appointed to consider millwork costs and the report they brought in is as follows:

In the first place we have only considered such items as generally affect all members of the Association, such as inside and outside door and window frames, feeling that with these essential items on a proper basis, the better grades of mill work such as stairs, panelling, etc., will naturally adjust themselves.

Each member of the committee gave the subject considerable attention and worked out the costs in each factory individually and on meeting together were surprised at the similarity of their results and, therefore, feel that the figures shown represent the actual facts. Facts, with which we as mill men are suffieiently familiar.

All estimates on outside frames are based on using white pine throughout and all frames are figured assembled or built up. The costs arrived at and agreed upon are as appended, and we are indebted to Mr. Richards for printing them.

The question of trim has not been considered as it is simply a matter of computing casings, etc., per lineal foot from any of the published wholesale lists, and which costs, plus freight, should represent our own productive costs on these items. Your Committee also found in this connection that nearly every mill had a different system of supplying such trim so that no set cost could be shown.

Please bear in mind that the prices shown are costs and do not include any profit whatever. This must be added and can only be determined by each individual member.

Your Committee were a unit in expressing the opinion that, under present conditions and prices, our factories are being run either at a loss or on altogether too small a margin of profiit, considering the investment involved, being merely an adjunct to our yards, and recommend that some effort be made to place the factory upon a more profitable footing so that it can stand independent of the yard as regards profits.

Under existing conditions the yard man who has no mill, and is buying his mill work from a nearby factory has a more remunerative investment than the man who has the drag of a factory upon his hands, a condition which, in our opinion, should be remedied.

Factory Costs Report.

The figures snbmitted by the Mill Work Cost Committee were as follows:-

Window Frames—

For either frame or brick veneer wall up to glass width of 30 in., 19 ft. B.M. white pine in jambs, heads, etc., at 10c	$1.90

Mouldings—

16 ft. blind stop, wt. pine, 1½	.24
16 ft. parting stop, wt. pine, 1½	.24
16 ft. O.G. 1¾ stop, wt. pine, 1½	.24
16 ft. brick mldg., wt. pine, 3	.48
	$3.10
15 per cent. lumber waste	.46
4 pulleys	.40
Machine work and assembling	1.25
Nails and screws	.12
Cambers and braces	.50
50 per cent. overhead cost on labor	.63
Total cost	$6.46

The price of $100.00 per M. on wt. pine lumber in jambs, etc., has to take care of difference in sizes of jambs, etc.

Window frame for solid brick wall, add	.50
For same window frame for glass width over 30 in. and without transom bar, add	2.25
Double or mullion frames	Double above prices
Triple frames	Three times above prices

Casement Window Frames—

Cost based same as above, say for glass size 24 in. x 30 in. 1 lt.	$5.90

Sash and Doors—

Cost on these not gone into, owing to the complete information in Sash and Door Association Catalogues, showing actual cost to us.

Outside Door Frame—

24 ft. B.M. wt. pine in jambs, at 10c	2.40
18 ft. brick mldg., at 3c	.54
Cambers and braces	.50
Nails, etc.	.10
15 per cent. waste on lumber	.44
Labor, machine and nailing up	1.25
50 per cent. overhead on labor	.65
Total cost	$5.88
If 2 in. oak sill, add	1.00

Inside Door Frame K.D. with Stops Supplied—

18 ft. R 1 x 6 clear Y. pine, 9 ft. at 10c	$ .90
18 ft. R stop 1¾ pine, at 2c	.36
	$1.26
15 per cent. waste on lumber	.30
Labor	.40
50 per cent. overhead on labor cost	.20
	$2.16
For arch jamb, add	.50
For 2 in. rabbetted jambs, same basis	2.40
For 2 in. arch jambs, add	.75

Cellar Window Frames—

12 ft. B.M. 2 x 8, 16 ft. B.M. wt. pine, at 10c	$1.60
4 ft. B.M. oak strip	.15
15 per cent. waste on lumber	.26
Nails	.10
Actual labor paid	.75

50 per cent. overhead on labor cost ..... .38

$3.24

For coal chute frame with oak sill, add 1.00

In an effort to ascertain whether or not these figures were approximately correct and in line with the cost figures and methods in vogue in other districts, the "Canadian Woodworker" submitted this report to a number of prominent woodworkers and others vitally interested in this field, asking for comment and suggestions. Several interesting replies were received, two of the most interesting from H. T. Didesch, of the Millwork Cost Information Bureau, and from C. B. Harman, of the Southern Sash, Door and Millwork Manufacturers' Association, are reproduced herewith.

Mistake in Application of Overhead

For Correct Results Burden Should be Sub-divided and Applied Differently — Outline of System Followed in Many Plants

By H. T. Didesch, Millwork Cost Bureau, Chicago, Ill.

The compilation of frame costs recently prepared by the millwork cost committee of the Southwestern Ontario Retail Lumber Dealers' Association, if subjected to critisism, must be said to contain a decided misapplication of the factor of the cost called "burden" or "overhead". Too frequently this same fault is in evidence. Many cost tabulations, when analyzed, will be found painstakingly accurate in respect to the material and labor elements, but through the haphazard adoption of an illogical and inequitable burden plan, the otherwise accurate records become thoroughly distorted, with the result that the final costs thus determined

H. T. Didesch, Chicago, Ill.

are inaccurate and actually too dangerous for use

In the case under review, the millwork cost committee resorted to the burden plan known as the "percentage of labor plan". This plan provides that the gross amount of burden accruing during a certain period—preferably a twelve-month period—be divided by the total amount expended for direct labor during the same interim. The resulting percentage is then applied to all direct labor charges that occur during the succeeding months. Without question, the per cent. of burden thus arrived at is arithmetically correct, but the application of that percentage to individual jobs or orders produces some glaringly inconsistent results. To illustrate this condition it is necessary only to cite the following example:

Two sawyers are engaged in cutting up plain red oak for finish. Brown, a very efficient sawyer, receives a wage of 70 cents per hour, while the other man, Smith, is less expert, and is paid but 60 cents per hour. The cost calculation for both men, considering a work period of eight direct hours, would be:

Example "A" (Brown).

Labor, 8 hours at 70c	$ 5 60
Burden, 145 per cent.	8.12
Total cost	$13 72

Example "B" (Smith).

Labor, 8 hours at 60c	$ 4 80
Burden, 145 per cent.	6.98
Total cost	$11 78

Whether or not Brown's cut resulted in a greater net footage than Smith's, it is evident that the burden charged against Brown is exvessive or otherwise that charged against Smith is too low. Both men work continuously for eight hours and in each case the actual burden consumed should be identical, or at least substantially so. The heavy factors of burden, viz., floor space, heat, light, water, etc., are the same for each operative, and while Brown may have used a trifle more of power and oil, and perhaps the wear and tear on his saw was just a little greater, these differences would be hardly perceptible and, under no circumstances, would equal 17 per cent. more than Smith's burden.

Then consider also the case of two benchmen—Jones and Young. Jones, a skilled artisan, who performs such work as carving out stair rail crooks, assembling radius stringers, etc., is paid 80 cents per hour. Young is an apprentice, who nails up cap trim, common porch posts, etc. His rate is 50 cents per hour. Figuring their respective costs for a period of eight direct hours would show results as follows:

Example "C" (Jones).

Labor, 8 hours at 80c	$ 6.40
Burden, 145 per cent.	9.28
Total cost	$15.68

Example "D" (Young)

Labor, 8 hours at 50c	$ 4.00
Burden, 145 per cent.	5.80
Total cost	$ 9 80

Here again is a pronounced miscarriage of the theory that factory burden or overhead increases or decreases in direct proportion to the cost of the labor required to produce a given article. In fact, it would appear on the surface that efficiency tends to high

overhead, whereas actually the reverse is true. Within certain limits, burden consumption does depend on labor expended, but not on the value of the labor expended. The whole trouble lies in the fact that the dollar is not the basic unit of measure for factory burden application. The proper unit of measure for burden in the factory operations of a millwork establishment is the "man hour." Assuming, for instance, that it has been determined that the burden rate per man hour in the factory is equivalent to a flat rate of 97 cents per hour, the former examples "C" and "D," recalculated on this basis, would produce results, to wit:

Example "E"—High Wage.

Labor, 8 hours at 80c	$ 6.40
Burden, 8 hours at 97c	7.76
Total cost	$14 16

Example "F"—Low Wage

Labor, 8 hours at 50c	$ 4.00
Burden, 8 hours at 97c	7.76
Total cost	$11.76

You will observe that the "man-hour" plan of burden application, which involves charging for the use of the factory's equipment and its maintenance, on a basis of the time during which these facilities were in use, is basically sound. It precludes the possibility—as in the "per M of material" plan—of placing an exorbitant burden against those types of work of which the bulk of final cost is material, or an inadequate burden charge on those classes of product that consist largely of labor. Neither will this method—as does the "percentage of labor" plan—saddle on the high-priced, efficient workmen an excessive amount of burden and permit less skilled workmen and novices to absorb only a small burden, when by reason of the additional supervision that they require and the spoilages that they are responsible for, they should absorb the same factory burden rate as the efficient workmen.

The straight "man-hour" plan is excellent as concerns operations within the factory itself, but if the entire burden of a millwork institution is applied at a flat rate per hour, a serious difficulty arises in respect to the traffic in goods not produced within the plant. This particular point, as well as a number of others not considered in the cost plan of the S.O.R.L.D.A. Committee will be further emphasized in the following description of the burden plan that was evolved by the Millwork Cost Bureau and has been in use by its membership for the past six years.

Dividing Overhead Into Units.

The first point recognized is that every mill operator engages to a certain extent in what may be termed a jobbing business; that is, he sells some commodities that for one reason or another are not produced in his own plant, viz.: glass, stock doors and sash, roofing, sash cord, pulleys, weights, screen wire and frequently all veneered doors, except, perhaps, those that cannot be obtained from other sources within a reasonable time. Hence it is absolutely necessary that he know his cost exclusive of selling expense, so that he may determine whether it is to his advantage to buy an item on the outside or to produce it in his own plant. With this thought in mind, the M.C.B. plan draws a line of demarcation between the actual manufacturing and the disposing or selling units of a mill. In other words, the "factory cost" or the cost of all items in their manufactured state is determined first and the charge for warehousing, packing, delivery, selling and administrative expenses, which is termed "commercial burden," is then added as a percentage burden of the "factory cost," the addition of the two costs producing total cost.

The M.C.B. plan takes cognizance also of the fact that bear no relation—from a cost aspect—to the operations of the factory itself, for which reason lumber yard and kiln costs are diffused only over the material handled through these units. These expenses are called "yard burden" and "kiln burden," respectively.

Those expenses relating solely to factory production are segregated as to machine and bench operatives, so that the direct machines and bench men may be burdened at a rate of reflecting their respective proportion of the factory burden.

A distinction between machine burden and bench burden is clearly necessary when it is borne in mind that the machine men consume a much heavier portion of investment in the form of the machine equipment itself, repairs, power and supplies, than do the bench men. Both classes, of course, are subject to one broad, general burden for floor space, heat, light, supervision, etc., and this element is distributed equally to each class of workmen.

Summarizing the Unit Burdens as they exist in the M.C.B. plan, there are then five basic rates, to wit:

1. Lumber—Yardage and Handling Burden, which is expressed as a flat rate per 1,000 gross board feet. The average rate of all Bureau members who operate the "Standard Cost Finding System" is at present $5.20 per 1,000 feet.

2. Lumber—Kiln Burden, which is expressed as a flat rate per 1,000 gross board feet. The average rate is $6.00 per 1,000 feet.

3. Machine Burden, which is expressed as a flat rate per man-hour. The average rate is 54 cents per hour.

4. Bench Burden, which is expressed as a flat rate per man-hour. The average rate is 31 cents per hour.

5. Commercial Burden, which is expressed as a percentage of the factory or manufactured cost. The average rate is 20 per cent. of factory cost.

Each of the burden rates, enumerated above includes its proper share of interest on investment for land, buildings, equipment and average stock; taxes on the same assets; depreciation on buildings and equipment, and insurance on buildings, equipment and average stock and, of course, also the supplies, repair and labor expenses peculiar to each unit. In this connection it might be well to point out that the nails and screws, which, in the tabulations of the S.O.R.L.D.A. Committee, are shown as direct charges, would, under the M.C.B. plan, be considered indirect charges; that is, they are included in bench burden.

Might Result in Manufacturing Losses

C. B. Harmon, Southern Sash, Door & Millwork Manufacturers' Association Outlines Views

I greatly appreciate the printed article which you have sent me, being a committee report of the W O R.L. Dealers' Association held at Chatham last March, all of which I have read with a great deal of interest For a good many years the millwork factories in our section figured their costs something similar to what you have indicated in Canada, but which we have long since found to be inaccurate and unsafe.

I do not happen to be a technical cost expert, but from information which we have gathered throughout this section during a period of five years, do not hesitate to say that we would consider the method as worked out by our Canadian brethren very unsafe indeed; I refer more especially to the percentages of overhead which they use.

We have adopted and are using the system of the Millwork Cost Bureau of Chicago, Ill., and after very wide and careful tests and study they placed the burden of overhead in four divisions, viz., lumber burden, machine labor burden, bench labor burden and commercial burden, which I will indicate to you from a recent cost exhibit just received at my office, as follows

French Doors.

One pair French doors, opg. 5 ft. 0 in. x 6 ft. 8 in., 1⅜ in. thick, each door divided 15 rectangular lights, 3 lights wide, open for glass, with stops, stiles and top rails 4¾ in. over all, bottom rail 9⅝ in. over all, bars 1⅜ in. over all, white pine.

Cost.

Material—Basis 1½ in. C. & B. tr. White Pine—			
Delivered purchase price	$95.00		
Lumber burden	5.20		
Without waste	$100.20		
Waste 20%	20.04		
35 net bd ft. 1½ in. white pine @	$120.24	$4.21	
120 lineal ft. ½ x ⅝ glass top @	1.22	1.46	$5.67
Machine—			
Labor 6.00 hours @	.61	3 66	
Burden 6.00 hours @	.54	3.24	6.90
Bench—			
Labor 3.00 hours @	.69	2.07	
Burden 3.00 hours @	.31	.93	3.00
Factory cost			$15.57
Commercial burden 20%			3.11
Total cost			$18.68

You will note from the above that the total amount of overhead, or burden, figures $7.28, the total amount of labor used in the operation being $5 73; using the method of your Canadian factories as reported to me. their burden or overhead on the pair of French doors would only amount to $2.86½.

The lumber burden of $5.20 covers the handling and carrying charges of the lumber.

The machine and bench burdens used covers nails, screws, glue, and all other supplies, with the exception of lumber—power, insurance, depreciation, repairs, upkeep, superintendent, foreman, detail, etc.

The commercial burden covers all office expenses, bad accounts, trucking, selling and collecting, etc.

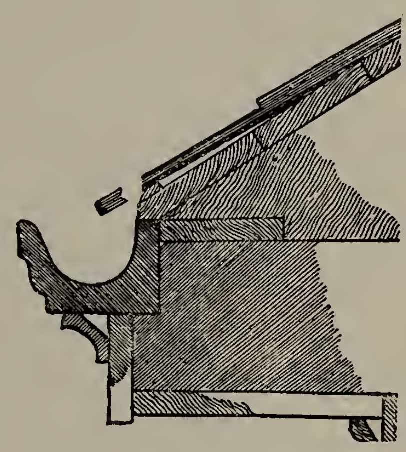
Please note that the foregoing cost exhibit treats each factor of cost in a logical and equitable manner, and if it is not amiss to make recommendations, it would appear that Canadian manufacturers of millwork would do well to avail themselves of similar methods.

The health of the nation depends largely upon its inhabitants being housed in well-built and designed houses.

Some of the small woodworking machines save almost as much labor as the larger ones.

Wood Gutters Are Best

Wood, because of its natural qualities, is basically a stronger construction material than metal. The application of the word "decay" to the disintegration of wood is really a misnomer, for wood never decays: disintegration is caused by fungi which eat the wood. Fungi can be poisoned and hence to-day by the use of wood preservatives wood can be rendered immune to destruction. Such is not the case with metals, however. Disintegration in metals is not caused by fungi, but by chemical action. Chemical action is a natural



Details for application of wood gutter

result of the oxidation of the metal and is usually hastened by acids held in mechanical solution in the air, particularly in cities where there is a great deal of coal smoke. Thus it is that metal gutters rust or disintegrate quickly, but wood gutters last on and on.

It is a strange fact that many woodworkers are not aware of the virtues of wood gutters. As illustrating this point it may be well worth while to cite the example of the Chicago Housing Association. The Bright-Diamond Construction Co., which erected the houses for the Chicago Housing Association, has for many years advocated and insisted upon the use of wood gutters and wood down spouts. When it came time to get the wood gutters for the houses which it was building in Chicago, no wood gutters could be found in the city, but after considerable search some suitable clear fir timbers were found which were taken to a planing mill and run to gutters. Incidentally one of the features of the houses most frequently commented upon by visiting architects and town planners was the use of wood gutters and wood down spouts and a frequent comment was to the effect that the use of wood in these two places solved a very perplexing problem.

Railroads seem to favor wood gutters, many of the better known lines using it exclusively in the construction of stations, freight sheds, warehouses, shops, etc.

The design of the gutter itself and the manner of applying it to building adds greatly to the attractiveness of the structure, for the fir gutter in reality becomes a part of the cornice itself and completes the finish of it.

Boxmakers who are without box printing machines are losing a good deal of good paying work.

Problems in Standardization of Dimension

Subject Discussed from Viewpoint of Wood Users—Dimension Material Offers Certain Savings and Other Advantages—Tendency Toward This Practice

By Wm. A. Babbitt, Chairnan, Committee on Standardization

In our second discussion of the problems of the standardization program, published in the June "Canadian Woodworker and Furniture Manufacturer," the writer pointed out at some length and in detail, the necessity that lumbermen should understand and give due consideration to the wood user's point of view. There is plainly an equal necessity that the wood user should understand and appreciate the lumberman's point of view.

It would seem fair to make a general statement that there is no consideration which will warrant any lumberman in undertaking to manufacture standardized dimension stock, or anything at all, except a sound and reasonable probability that this line of production will pay a fair profit. No matter how strongly the lumberman may be moved by a patriotic desire to co-operate in reducing and finally eliminating the great wastes now obtaining, neither patriotism nor any other consideration of the kind should obscure the basic fact that no unsound, uneconomical business can possibly be patriotic—not even a government railroad administration. No student of the present industrial situation would seriously question the assertion that the demoralization of the lumber industry constitutes the principal cause of the appalling demoralization in the wood using industries. Our foundation has been removed.

Must Change Ideas.

Many of the wood user's most difficult problems are of a psychological kind. It is the "squint" that we have acquired from a long but not altogether venerable tradition. Recently a high executive in a big woodworking industry remarked to the writer: "We have got a funny row on in our plant between the engineering and the purchasing departments. The designer specifies ash for a certain unit, for which laboratory tests show that other hardwoods are equally serviceable. We have on hand sufficient white oak dimension salvaged from other operations to fill this requirement, but no ash. The purchasing manager says he has got to be shown that ash won't do; and the designer says he won't have anything else. So there you are."

Evidently our first problem is to see that our specifications are reasonable from the dimension manufacturer's point of view. We must help our designers to get rid of the idea that they have a free hand to design without reference to the restrictions of raw materials. I speak as one who has bought costly experience. Such an attitude will not only give to our supply sources confidence to produce, but it will greatly conserve and foster the processes of economical production in our own plants. The designer who insists on refusing to use a half million feet of white oak in stock, and on enforcing the purchase of a half million feet of white ash, which for the purpose intended had no advantage, needs "the hook."

The standardization committee is endeavoring to follow out this suggestion in all its procedure. We do not publish any standardization until the rules committees of the Lumber Associations interested have ample opportunity to scrutinize and criticize the conclusions of this committee. Our next problem is to erase completely from our business thinking the old and prejudicial tradition that dimension is made from waste, which costs nothing and that consequently dimension ought to be sold around that figure. It is proper for the lumberman to reply that this idea is correct, providing you can find any waste around your own shop "which costs nothing." The main purpose of this article is to set out plainly the real values which are found in standardized dimension as compared with the lumber necessary to produce our dimension in our own plants. We must be prepared to pay, for dimension, a fair price.

Closely related to the foregoing is the new problem of readjusting our ideas to the new methods of handling, seasoning and routing our stocks of lumber, in the form of dimension. The technical problems are already the subject of intensive study, with the collaboration of the Forest Products Laboratory. Yardage requirements will be greatly decreased, as will be requirements for kiln capacity. The writer believes that it will soon be established that the kiln work should be done by the "dimension producer." At all events the kilning of dimension stock requires a procedure of its own. Possibly this can be accomplished more economically in the plank at the sawmill than by any other method.

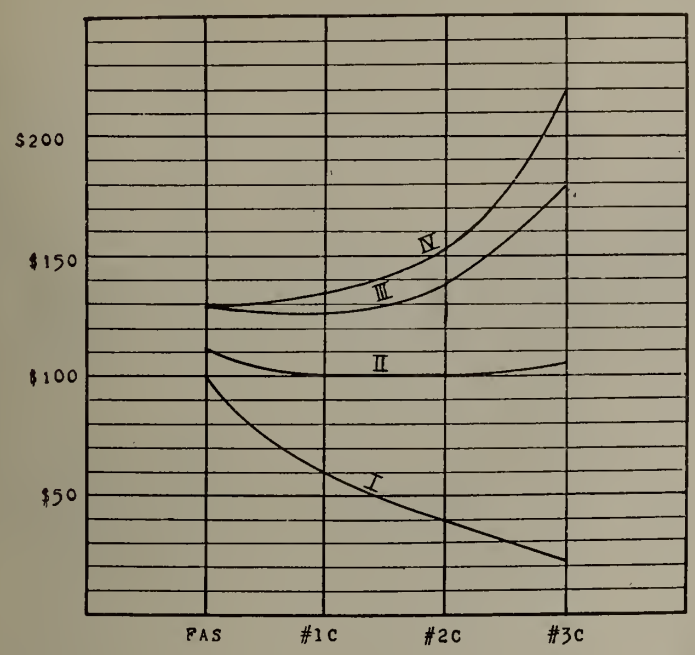
Standardization will also mean the elimination of most of the preparatory processes, taking the wood using industries as a whole. The big "saw-room" will fade to a mere shadow of its former greatness and nuisance. The saw room force will be busy assembling wood products. Business in kindling will greatly dwindle. Cost accounting will probably begin to take on a semblance of veracity—utopian and unbelievable as the statement may read. However, the road to all these desirable results is a long one, and not without very great difficulties.

Theoretical Values of Hardwood Dimension.

The expression "theoretical values" is used because so far it has been possible only to check actual values in a limited way. These theoretical values are actual values, as far as this work of checking has been carried, but might show considerable variation when compared with other lines of experience. For the same reason it is necessary to confine this discussion to hardwoods, although the work of standardization must eventually also cover all coniferous woods.

In the study that follows, we have considered all the lumber portion of the products of the log which grade No. 3 C&B. According to the U. S. Forest Service's Bureau of Industrial Investigations, this is only 40.3 per cent. of the content of the log. So it is evident that when standardization for hardwoods is complete only 40 per cent. of the log will have been "conserved." Among the waste items outside this study are

CHART I



This graph is designed to indicate four comparative values of full mill run hardwood lumber from the viewpoint of a buyer whose location from the originating mill involves a 35 ct. freight rate.

1. Cost of mill run lumber at shipping point.

2. Cost of mill run lumber to make clear stock per thousand feet B. M.

3. Delivered cost, at 35 cents per hundred, of lumber necessary to make 1000 ft. B. M. of clear stock.

4. Total cost to wood user per M. ft. B. M. of clear turning squares, with allowance for manufacturing and disposing of waste.

the following percentages of waste in handling the average hardwood log: Kerf, 13 per cent.; slabs, 12 per cent.; edging and trimming wastes, 12 per cent.; bark, 13 per cent.; and other, about 10 per cent.

Very complete and exhaustive studies have been made by the National Association of Wood Turners as to the clear content of mill run lumber for turning squares. Roughly speaking, northern hardwoods run 50 per cent. of clear stock; while some southern hardwoods run as hgh as 60 per cent. clear stock suitable for turning squares. The following analysis of northern hardwoods (beech, birch and maple) has been checked with the recent cost studies given out by the Michigan Hardwood Association, and incorporates their realization prices, as of May 1st, 1921. Bear in mind that all wood fabrication requiring clear hard wood stock can now draw only 20 per cent. of the content of the average hardwood log. Even the selects fail to affect this slight margin to a practical extent. For easy reference, we have set this up in the form of a chart.

It is interesting to note that the footage value-at-mill of clear cuttings for wood turning stock equalizes in all four grades, very nearly. But as soon as freights and costs at the wood user's plant are added, FAS is by long odds the cheapest lumber to buy, as it is generally known. This is in spite of the fact that the spread between No. 1C and FAS is abnormally large, at the present time.

Great Savings in Lumber and Freight.

Now, if the establishment of a market for standardized dimension stock becomes effective, by means of which the bulk of low grade lumber (and all mill waste possible) can be marketed as net dimension, the enormous wastes and expense involved in shipping low grade lumber will be eliminated.

Freight will have to be paid only on the net usable salvage of low grades and waste. Now ostensibly the cost of freight is included in the price of the lumber and loaded on the buyer. Actually, it is an open question which party is paying the freight. About now the lumberman is not only paying all freight, but he is paying considerable in addition for the privilege of shipping on that basis. Last year, at this time, it was the other way 'round. However, the freight paid on the non-usable portion of graded hardwood lumber is a dead loss, whoever has to pay it. The conversion of low grades into net dimension will entirely relieve both parties from all liability to pay this dead loss, which in the aggregate is a staggering sum. Possibly a thorough study of the freight problem would lead to a

The white areas represent the relative amounts of freight wastes involved in shipping the four standard grades of hardwood lumber. Black areas show the freight paid on stock usable for such purposes as furniture, wagons, and wood turning and shaping.

CHART II

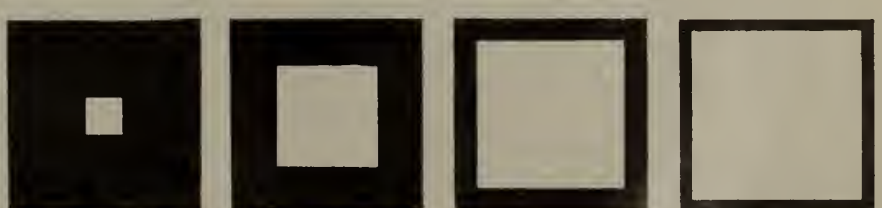


Fig.1 FAS Fig.2 1C Fig.3 2C Fig.4 3C

different conclusion, but apparently the money values involved in this single item of freight waste is a sufficient warrant for both lumbermen and wood users to league together to make effective the whole program of standardization.

In order to bring this out as graphically as possible, we have prepared the following chart. The black portion of each square represents the relative amount of freight paid on the usable portion of each commercial grade of hardwood lumber. The white portion of each square represents the relative amount of freight waste involved in shipping commercial lumber. The total amount of this waste is only six points less than the freight on the usable portion. This means that the freight charges on all raw materials for hardwood fabricating industries such as furniture, are almost exactly double what they need to be. The fluctuation between the "buyers'" and the "sellers'" market decides which party has to pay this double freight charge.

In these three papers an attempt has been made to discuss the general problems of the standardization program. No attempt has been made to handle any of the patriotic or altruistic phases—not that the value of these considerations are held to be of minor importance. No attempt has been made to furnish a technical basis on which to undertake the manufacture and marketing of dimension stock. These factors will be dealt with as occasion may arise.

Summarization of Advntages.

To summarize the considerations which have been discussed more or less adequately, as sound reasons for both lumbermen and wood users to give their support to the standardization program, we have arranged these considerations in parallel columns, as they affect favorably one or the other of the parties at interest.

Lumbermen	Wood Users.
1. Provides a market for product of surplus low grades and mill waste.	1. Eliminates all cartage and handling wastes.
2. Greater utilization of product of tree means lower cost of stumpage and conservation of standing timber.	2. Eliminates all freight wastes.
3. Dimension production will concentrate total wastes at mills, thus making commercial salvage operation feasible.	3. Reduces the volume of stocks necessary to be carried.
4. Dimension production will effect very large savings in shipping costs.	4. Eliminates the necessity for extensive yards, and the fire hazard incident thereto.
5. Will relieve the abnormal pressure on high grade lumber.	5. Eliminates the old time "preparatory department" to a large extent, with all its wastes.
6. Establishes a series of production operations at the mill now carried on at much greater cost at the wood user's plant	6. Eliminates the problem of disposing of large quantities of waste.
7. In most mills would establish a year round operative basis, which will reduce overhead and stabilize labor.	7. Will doubtless favorably affect cost and speed of curing stock.
8. Provides a market for product of short logs, top logs, and all logs too small to produce FAS.	8. Will favorably affect overhead by reducing requirements for floor space, yardage, kilnage, light, heat, power and all similar charges. ed up in lumber piles
9. Gives production value to crooked logs, and the large branches of some hardwood trees.	9. Will reduce charges for capital now lock-
10. Will greatly reduce the cost of selling low grade lumber.	10. Stabilizes and standardizes basic cost of raw materials for related classes of production, for the entire industry.
11. Careful students believe that the opportunity which dimension production offers lumbermen as a means of adapting their output to varying market conditions will result most favorably in the direction of stabilizing the whole industry.	11. Affords production managers an established basis for gauging and speeding production.

As one looks over this rough summary at least one fact sticks out big and plain. It's a good proposition for all concerned. Just where the weight of advantage lies, time only will tell. Also time will adjust that advantage (if any) so that the whole problem will be on the same basis as ordinary transactions in commercial lumber.

How About the Price?

Somewhat with trembling and fear we approach this subject. But we have to admit that this thought is in the minds of all. What shall we pay for standardized dimension stock? Or, to put it another way—what price has the producer a right to charge? Without any question, eventually the price will be determined by the two factors of supply and demand, and its relative advantage to wood users as compared with commercial lumber. The usual sparring for price advantage is to be expected. Sometimes the market will be a buyers' market, and sometimes a sellers' market. No sensible business man would want anything different, under existing conditions.

Probably it would be a pure guess to make a suggestion for a basis—so to speak, a place to start from. Looking over past history; considering the parity of advantage that is likely to accrue both to producer and user of standardized dimension stock; having due regard for the ominous outlook for future forest resources; realizing that almost to a certainty the producer will protest "too low" and the user will retort "too high," and unitedly chase the writer to the tall timber; nevertheless said writer, speaking for himself only, elects to suggest this basis: "Let the parties at interest start the discussion on the basis of a parity in price beween No. 1 standard dimension and combined first and second grades of commercial lumber, applicable at the outset to the following industries: Furniture, Automobile, Wood Turning, Wood Shaping, Agricultural Implements.

Genenal view of office, plant and power-house, Langslow, Limited, Cobourg, Ont.

New Furniture Factory at Cobourg

Modern Well-equipped Plant Recently Put in Operation — Output Consists of School and Household Furniture — Interesting Outline of New Project

One of the youngest members of the Canadian furniture industry is the newly incorporated firm of Langslow, Limited, Cobourg, Ont. This company, which is the Canadian branch of the old-established Langslow-Fowler Co. of Rochester, N.Y., recently completed an up-to-date factory at Cobourg, Ont., and are operating it on an ever-increasing scale. Previous to the establishment of the Canadian business, the parent organization in Rochester had succeeded in working up a nice connection in Canada, especially in school furniture, and it was to take care of and develop this field that the Canadian company was organized.

The new plant, which is situated on the site of the old Crossen car shops, consists of a modern, well-lighted, two-storey factory, having a floor space of 26,000 sq. ft., a separate power plant and a two-compartment Standard dry kiln. In planning this factory, due consideration was given to future expansion, with the result that provision has been made for the construction of another unit of about the same size when found necessary. The site is an ideal one in many respects, as there is ample yardage and excellent rail and water facilities. The total investment is in the neighborhood of $250,000.

Flooded With Daylight.

The factory proper is of brick and mill construction. As will be noted in the accompanying illustration, the question of light has not been overlooked. The building is long and comparatively narrow, so that each machine is liberally flooded with daylight. The floor in the machine department is of concrete, while hardwood is used for the rest of the building. An automatic sprinkler system has been installed to lessen the fire risk.

The equipment is conveniently placed at one end of the lower floor and the remainder of the floor is used for assembling. A few machines were brought from the Rochester plant, but the bulk of them were purchased in Canada. A partial list is as follows: C. M. C. endless bed sander, Taylor revolving clamp carrier (power drive), Preston and C. M. C. band saws, C. M. C. resaw, Cowan vertical borer, two American horizontal two-spindle borers, C. M. C. glue jointer, C. M. C. straight edging and jointing saw, two swing cut-off saws with roller beds, three variety saws, two shapers, drum, disc and belt sanders, McKnight hydraulic bending press, Preston steaming retort, two planers, two buzz planers, special machine for shaping hollow chair seats, Dodds dove-tailer and several other pieces.

The second floor is used for finishing, storage and packing purposes. A spraying machine is being set up to help cut the finishing costs. An inclined platform, or ramp, connects the storage and packing departments with the shipping floor. With this inclined way it does not take long to move a carload of crated pieces down to the shipping platform.

Uses Electricity Entirely.

Electricity is the prime mover employed, the group drive being used. Seven motors have been connected up as follows: Three 50 h.p., one 20 h.p., one 15 h.p., one 7½ h.p. and one 5 h.p. For the present the juice is being purchased from the Hydro. Later on a steam generating plant will probably be set up. Both the power house and the boiler installation, which consists of two 150 h.p. boilers, manufactured by the Engineering & Machine Works of Canada, Limited, St. Catharines, Ont., is large enough to take care of the steam generating equipment. One of the boilers is being operated to heat the factory, dry kiln and glue pots and to provide steam for the steaming retorts in which the stock to be bent is treated. The power house and factory is connected by a tunnel running under the tracks which separate the two buildings.

The shavings and sawdust is conveyed to the power house by a shavings exhaust system installed by the Canadian Blower & Forge Co., Ltd., of Kitchener, Ont. Most of this material is conveyed direct to the fires as fast as it is manufactured, while a storage vault has been built to take care of any surplus over and above that required to maintain the necessary steam pressure. This surplus will be drawn on if found necessary to supplement the supply from the factory. For this purpose a small fan is being installed to lift the shavings from the storage vault and convey them to the fire box. The wood cuttings from the factory are thrown

in boxes or barrels as made and then conveyed to the boiler room or lift trucks.

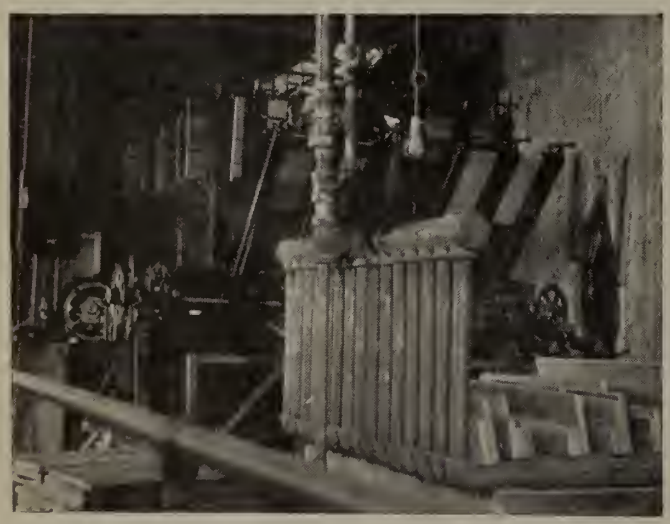
The demand for the Moulthrop school desk, which is one of the principal lines manufactured, is such that the present output is confined to the production of this patented school desk and a number of office and school chairs. The Moulthrop school desk, which is made in six sizes to accommodate scholars of different ages, is of the individual or unit type, that is, it consists of the chair and table in one unit. The table or shelf is adjustable for heighth and a commodious drawer is provided under the chair seat to take care of the school books, pencils, paper, etc. Quartered oak, in golden finish, is the wood used, although a few desks have been made of birch and finished in mahogany. The school chairs are made in quartered oak.

This line will be added to and it is expected that by fall the output will consist of a complete range of household furniture, including upholstered and wicker lines. The yearly volume of business covering all lines manufactured will in all probability exceed $400.000.

Trouble Securing Mechanics

Cobourg is not a woodworking centre, so that at the start some difficulty was experienced in securing skilled hands. This was aggravated by the fact that there was hardly a vacant house to be had in the town. A number of skilled mechanics were brought in and others less skilled are being trained in the ways of woodworkers. It is just possible that an industrial housing scheme will be undertaken to provide accommodation for some of the employees. The pay roll embraces about sixty hands. This number will likely be increased to 150 as the new lines are added and production increased. Another convenience for the employees which is under consideration consists of preparing and equipping a large athletic field and ball park at the side of the factory. This will enable the men to enjoy such games as baseball, football, tennic, etc.

The personnel of Langslow, Limited, is practically



Heater for warming stock, and Taylor revolving clamp

the same as that of the American Company, and consists of Stratton C. Langslow, president; Harry R. Langslow, vice-president and managing-director; Paul Knox, treasurer, and T. McKend, secretary The American organization makes about the same line and gives employment to 600 hands. In 1920 about 5,000,000 feet of lumber was worked up and the resultant product was valued at $1,500,000.

An associate company that gives promise of assuming large proportions is the Rice Lake Canoe Co., Ltd., Cobourg. This company was organized to purchase the canoe manufacturing business of Daniel Herald, including canoe designs and moulds, and the well-known Herald patent. This business, which has been in operation at Rice Lake since 1862, was taken over in 1920 and moved to Cobourg. A well-lighted, one-storey factory giving a floor space of 8,000 feet has been erected close to the Langslow furniture plant and the

C. M. C. endless-bed sander in Langslow plant

manufacture of canoes entered upon on a somewhat larger scale. All the machine work is being done in the furniture factory, but a new two-storey building, with a floor space of 15,000 feet, will be added to the canoe factory this fall, and when completed all the equipment required in the manufacture of canoes, rowboats, launches, etc., will be installed, making this operation entirely independent of the furniture plant. It is expected that the output of the enlarged canoe factory will run from 1,500 to 2,000 craft.

An attempt will be made to work up an export business, including a winter market in Southern Europe, West Indies and other countries similarly situated. If the demand during the winter does not equal production, other lines, such as skis, toboggans, hockey sticks, etc., will be manufactured.

The Herald patent covers a double-skinned cedar canoe. The lines and details of construction are such that this canoe is a prime favorite with sportsmen and canoe enthusiasts. Some of these canoes have given fifty years' continuous service. Other lines include narrow strip, basswood and canvas canoes. Later on the manufacture of rowboats, launches, sailing craft, etc., will be undertaken. The woods used in the manufacture of canoes are B. C. and Ontario cedar, bass wood, rock elm for the ribs, oak for keels, snout, etc., and such woods as walnut, cherry, mahogany, etc., for deck material. Every effort is being made to maintain and even improve the quality and reputation enjoyed by the Herald product.

The officers of the Rice Lake Canoe Co. are as follows: Harry R. Langslow, president and managing-director; Stratton C. Langslow, vice-president, and T. McKend, treasurer, and R. Ernest Gunn, Secretary.

Every machinist will be well advised to start the habit of collecting technical books dealing with the industry.

Cost Accounting in Box Factories

Ascertain Profit or Loss at Frequent Intervals — Normal Percentage of Overhead Should be Applied — Per Thousand Feet Not Proper Basis for Figuring Costs

By A. J. Redemski*

In taking up the subject of costs with the manufacturer, it does not take very long after the first interview to find that the box manufacturer is very anxious to determine the cost on every solitary, slight variation in his product. It is very difficult to step into a plan and start out with the making of costs in that refined detail, unless a certain amount of preliminary work has been done. That preliminary work must be done on the books of account, because those books of account are the record of your business. You have used those heretofore, at least most of you, I am sure, more as a matter of keeping track of your relations with your customers and with the people you buy from, to compile entries of account of the different commodities you buy, the aggregate of the labor that you expend and the other expenses that you incur; and, at the end of the year, you take these accounts and write them all off into a profit and loss account, in that way determining whether you have made or lost money for the year.

"Business, as it is conducted to-day, will not permit of such a long period of waiting before you can really ascertain whether you have made or lost money and it is necessary to make some other provisions.

First Points of Consideration

"Before we proceed further, we should define cost accounting as a method of accounting by which a manufacturer may ascertain precisely at short intervals the profits and losses that he makes and the sources from which they are derived. About the only thing that is necessary to do is to separate on your books those items, those accounts which represent the stocks of materials and unabsorbed expenses from those portions of material and labor and burdens that continually flow into that product.

"That brings us to really the first vision of our cost problem. We have certain items of stocks and materials that are bought from time to time, which are going to be used in subsequent periods. We want the cost of our products that we are manufacturing from time to time and only such portions of the materials as are used to be written into the cost accounts. The labor, of course, is an item that should be distributed between the different operations and in the aggregate also thrown into the cost account.

Keeping Track of Burden

"The burden is something, as you all know, that fluctuates a good deal and especially in times like the present it would be a very difficult matter, with curtailed production as is going on to-day, to absorb all of that expense in the current product. You would soon come to the conclusion that the business from a customer, which in ordinary times seemed to you always as being very profitable, to-day is absolutely unworthy of your effort. That is not correct; that is not true. If you were going to penalize that business —this business that you are getting to-day with these excessive overhead costs—why, you would not get any; you would never come back; you would never fill your plant to the point where you would be running at full production if you took that viewpoint.

"In order to determine what part of the overhead this current business should bear, having in mind the curtailed production which almost everybody is laboring under, we ought to get back to an earlier period and determine what amount of overhead we can operate with; and if we are distributing this overhead on the basis of labor, determine what percentage of that overhead normally is the labor and then apply that to business as it is coming in to-day.

Work With Different Groups

"In all of these operations in all of the plants that I have seen, of course, there is a great variety of product made; part of the product may be shooks; part of it may be nailed; part of it may be cornered; and where conditions like these exist it seems to me that it would be a good idea by making a cost first on those specified groups of business, so that those divisions, those principal divisions can be reflected on the books of account and shown without difficulty in a single figure. Then, as this part of the record is perfected, we can go to a study of the different operations. You can begin to analyze the product which takes more labor than some other and the product which takes less labor than some other. Then we can begin to build up a range in those different operations that will give us a proper charge for one type of box against another type. To begin to do that at the outset will lead only to confusion.

It has often been said that during such periods as came to an abrupt close in the fall of last year there is no need for costs. Product is marketed without regard to them. That is also true to-day. The effect of the comparative conditions is entirely different. Costs are necessary in all times, good and bad, because they afford a means of studying cause and effect, and through that knowledge will exert a tendency toward the establishment of more stable conditions. And so we draw upon the record of the past to determine what constitutes a fair charge for overhead or burden.

A condition was also possible during the past year which passed unnoticed because in most cases it was not analyzed. This grew out of the fact that stocks of material were acquired at favorable prices and were later sold, in the form of boxes figured at higher market levels. Consequently the business showed what appeared to be a very satisfactory profit. It is possible, however, that the expense of converting lumber into boxes was done at a loss and that a part of the profit realized from enhanced value of lumber was used to offset a loss from conversion.

"In some of the cost work I did, notably in one piece of work, I started by laying out this general principle. We must first get the general tendency of the business reflected on the books, and afterwards we could take the information that went in to make up this record and analyze it and then make our divisions. I had an assistant on this work who differed with me

*Address before National Association of Box Manufacturers, Chicago.

and he began to change this plan around considerably so that he would get the exact cost on every item of product. In carrying out this work during my absence he influenced several of the clerks that were working with him to that same opinion. Of course, the two systems would not work simultaneously and it was necessary to eliminate him from the job. Consequently these two youngsters who had been trained under his supervision were called in and told that if they had any grievances in connection with carrying out this work, as it was originally intended, now was the time to get them straightened out.

"In the course of the discussion that followed I explained to these youngsters that they were working in a business in which the principal material was lumber, a product of nature and that from it they could probably draw a good many lessons, the most important of which would be that no product of nature makes its appearance by the complete structure. It starts out first by developing a trunk which will carry the saps and properties that are necessary to a future development; and once that trunk has been properly developed it will shoot branches and they in turn leaves, foliage, flowers and fruits, all in their order. But to start a cost system and to put all of those refined fruits and flowers on at first, is not going to last; and they will wither. On the other hand, if it is allowed to develop in a natural order, the structure will endure.

Real Value of Cost Figures

"There is one other thing to be said in connection with the plan of getting these figures and this information into the books of account. By segregating on your books the elements of cost that made up the cost of your product during that period, you will show the fluctuating volume and you will show all of the properties that have entered the product during that particular period; and from those accounts you will be able to build up statistical records from which, in times like these, you will be able to draw lessons which cannot be drawn from accounts as ordinarily kept, in which the different elements of cost are just accumulated for a year and then finally written in the profit and loss account.

"The statistical value of those cost accounts will mean more to you as managers of a business than a detailed knowledge of the many items that go to make up the cost of a product such as you make, so that the message that I want to deliver to you is that very little progress will be made in cost work in this association until we definitely establish this accounting proposition and get our costs tied into the books, so that any analysis that might be made hereafter and that might be made from those figures will be a check and will be balanced against the aggregates that are shown in your accounts and the aggregates which you, as manager, know and can follow.

"You cannot follow all of those little items. You will call on your cost department for those from time to time as you need them; but if you have not got them tied up so that when they are given to you they will represent a known, balanced fact, they will do you very little good and for that reason I cannot urge too strongly and that ought to be the first step in cost accounting procedure.

Should M Feet Be Basis?

"In the many years that I have been in touch with the activities of the National Association of Box Manufacturers, I have always heard this subject talked about and I know it had been discussed for a good many years before I had any contact with it in this association; and yet we are not at any point of definite expression regarding the elements of cost. Most of you, I know, are to-day figuring your product on the basis of so much per thousand feet. I do not believe that you are ever going to come to a point where you can discuss the cost of the different types of boxes on that basis. I believe that you will have come to the point of saying that there is so much material there; for instance, the material cost is so much and the cost of sawing certain kinds of stock is so much per thousand feet, the cleating is going to cost so much per hundreds sets, the making up is going to cost so much per hundred, the wrapping and shipping is going to cost so much per hundred and the same way with lock cornered boxes and some of the other products that are being made; and you will have to say that it is going to cost so much to make a hundred sets of partitions for bottle carriers and a number of other items of that character.

"Some of you may be thinking in terms along that line now and you may have some definite ideas as to what those costs are in your plants. You may also have records by which you can tell how much product you have put through your plant and through the several operations that constitute the plant and, if you have, why do you not take those rates that you believe are fair for the doing of those operations and apply them to the volume of product during a year and then see whether those rates that you believe are fair are going to liquidate your entire labor and overhead figure during that period.

"Of course, you will say there will be some difficulty about it, maybe because you cannot tell exactly how many boxes you cleated or how many boxes you grooved or how many of the minor operations you performed; but try it in connection with your sawing and with your making up and with your lock-cornering and then you have the bulk of your production at any rate and can see whether you are getting anywhere near your actual expenditure for labor and overhead. If you will, why, then, you have a pretty fair basis on which to start. You will then know that any qualifications that you are making in the sale of that product are not very far off and which can then be corroborated by records such as I have explained in the foregoing."

WAGE REDUCTIONS HAVE BEEN GENERAL

Reductions in the lumbering industry are reported from New Brunswick, where one firm reduced laborers from $25.50 a week to $15. In British Columbia skilled hands have been reduced 10 to 25 per cent., and in some cases hours increased from 9 to 10 a day. Laborers have been reduced generally from 50 to 40 cents an hour.

In the printing trades slight increases are reported in Ontario points and in Winnipeg, and slight decreases in Medicine Hat and in Victoria.

Except in New Brunswick and Alberta, wage schedules in the building industry in all provinces show declines. In Prince Edward Island there is a general fall of five cents an hour in all building trades. In Quebec points, there have been a decrease of from 5 to 15 cents, while bricklayers earn $1 an hour instead of $1.25. Ontario points show declines ranging from 10 to 20 per cent., and the same is true of the important centres in Manitoba, Saskatchewan and British Columbia.

Upholstering and Trimming

Modern Upholstering

Outlining Changes and Improvements Covering Last Fifteen Years — Employment of Down Outstanding Development

In the upholstering of furniture there has probably been a greater development in the purely mechanical side of the trade during the last fifteen years than during any similar period since the invention of springs, this unusual development being largely due to the employment of down as a filling material, says John W. Stephenson in The Upholsterer and Interior Decorator.

Prior to the advent of down, extreme softness in upholstering could not be obtained with plain surfaces because the softest materials known, unless confined by tufting, would separate and sag, soon becoming unsightly and uncomfortable. This explains in a measure the tremendous vogue there was, in the latter part of the nineteenth century, for deep-tufted upholstering.

Various plans have from time to time been devised for the use of feathers and down, but the efforts to use these materials have been more or less experimental until the return to favor of the English and Colonial wing and cushion chairs about twenty years ago, which gave an impetus to the experiments of progressive upholsterers, and the down cushion as an adjunct to the upholstering of chairs and settees became a definite and permanent development.

Problems Encountered.

The application of down upholstering naturally varies with different types of furniture, although in many instances the frame construction of standard shapes seems to have been only slightly altered, and it is even possible to adapt, for loose-cushioned upholstering, frames that have not been made for that particular style of treatment.

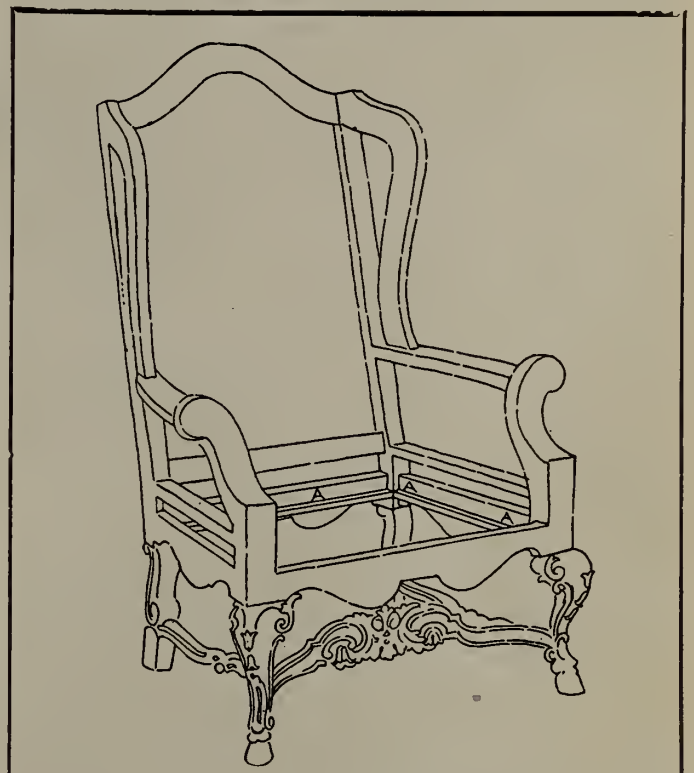
It should be borne in mind, however, that the limit of any type of cushioning is governed by the height of the seat of chair, settee or lounge from the floor, this constituting one of the chief contributing factors toward the comfort of the article when in use. To define the governing factors of height in general terms, the distance from the top of the finished upholstered seat to the floor should not be more than 18½ inches, and this only when the form of upholstering is very soft, such as down cushioning, which in use sinks to a point two or three inches lower than its finished height.

Even a solid wod set is sometimes made 18 inches from the floor, but greater comfort is obtained for continuous use in a much lower seat, and a chair recently designed for the use of industrial workers who are seated at their work, measured 16 inches from the lowest curve of the seat to the floor.

Provision for Fine Depth.

The matter of calculating for the use of down in furniture upholstering begins at the very genesis of the treatment of any particular piece. Starting with the chair shown in Fig. 1, the first consideration is given the webbing which supports the springs for the seat, this must be attached at a point as low as possible. This chair has a scalloped rail which precludes the possibility of employing a webbing stretcher. It should be made with the tacking strips indicated by A-A in Fig. 1, which enable the workman to tack the webbing at the bottom in the angle of strip and frame when stretching the webbing by hand, as shown in Figs. 1-A and 1-B. The webbing should be stretched as tightly as possible, with the chair upside down on the bench and securely tacked with both ends turned over the double tacked.

The webbed seat of the chair will appear as shown in illustration Fig. 2, the crosses indicating the posi



Details of frame of modern chair

tion of the springs. The webbing is shown in this figure without the interference of the chair frame so as to illustrate clearly the relation of the cross webs to the location of the springs.

Fig. 3 shows the position of the springs on the webbing, the circles indicating the bottoms of the springs, the first row of springs are hidden by the front rail of the chair, therefore they are indicated by dotted lines.

Spring Tied Down Low.

Fig. 3-A shows the position of the tops of the springs in their relation to the chair frame.

Fig. 4 shows the tops of the springs in their position after having been tied down. The tops of the springs are not usually permitted to be more than 1½ inches above the top of the rail, therefore, in order to give

sufficient slack to the twines when the springs are depressed, instead of being attached to the top of the rail, as in ordinary upholstering, the twines are pulled down to the bottom of the rail and there tacked, it being necessary, sometimes, to pierce the webbing in order to carry them on a straight line.

Fig. 5 shows a cross section, illustrating the method of tying the twines in relation to a single row of springs. The object of dropping the twines and catching the third coil on the front and back springs is to keep the spring surface of the seat as flat as possible. It is necessary, sometimes, even to pull down the tops of the springs to the webbing by long stitches in order to maintain a flat surface.

Fig. 6 shows the seat of the chair after canvassing over the springs. The edge of the canvas being tacked as low as possible on the rail as illustrated in cross section Fig. 7, or tacked on top of the rail with a gutter being sewed to the webing as indicated by the stitches a-a-a-a.

A HABIT IT HAS.

A safety director tells this one apropos the difficulty of teaching some people to observe the rudimentary principles of "safety first."

Wash White got a job in a sawmill. The boss put him in charge of a buzz saw, showed him how the saw worked, warned him of its dangers, and then went away.

Wash was fascinated by the shining whirling saw. But was it, truly as sharp and terrible as the boss had said? To test it he touched it gently with his finger. Zzz! and the finger was no more.

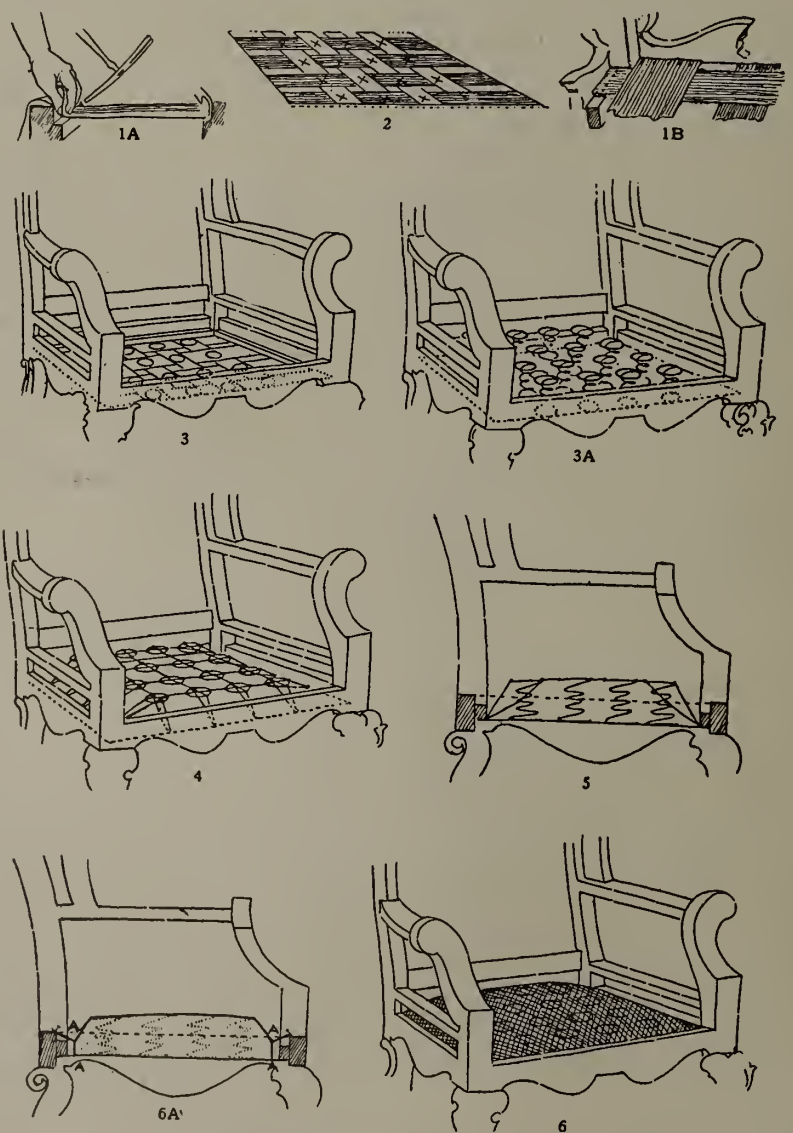
As Wash was ruefully tying up his hand in his bandana the boss came back.

"Hullo there, Washington. What's the matter?"

"Buzz saw done cut off my finger, sah."

"How the dickens did that happen?"

"Ah dunno, sah," said Wash. "Ah just touched de darn contraption like this an'—Fo' de land's sake, der's anudder gone!"



Building foundation for down filling

COMPLETES ATTRACTIVELY FINISHED OFFICES.

An attractive office building was recently completed by the Watt Milling & Feed Co., Limited, who operate a planing mill and woodworking plant in Toronto. The structure is a brick building 40 ft. x 35 ft., two storeys high. The upper floor is fitted up as apartments, which are occupied by two of the office staff. The lower floor is the office proper. This is attractively finished in oak and face brick. The street wall is a large plate window, and the entrance doors are situated at either corner. Upon entering one is confronted with a hand some oak counter, extending the full width of the office and flanked by some well-matched oak panel work on either wall. The counter itself is worthy of special mention, as it is a piece of high-class woodwork. All the woodwork, interior fittings and office furniture, with the exception of the desk chairs, was designed and constructed by the woodworking branch of their business.

At the rear of the oak counter are four private offices. These are finished in oak panel work on the outside to conform with the general decoration scheme of the office. The interior of these private offices are panelled in different woods as follows: Chestnut, walnut, mahogany and figured red gum. The idea back of this is that it enables them to show a prospective customer how panel work looks in the different woods and thus assist in making an intelligent choice.

The basement is fitted up with wash and locker rooms, also a large lunch room, in which has been placed a kitchen cabinet and a gas range. This is for use of the office staff. The foundation and construction is such that a number of additional storeys may be added if required.

MAHOGANY ASSOCIATION FORMED.

The American importers and manufacturers of mahogany met recently in New York to consider the advisability of forming an association consisting of those interested in the mahogany industry. Those in attend ance were unanimously in favor of perfecting such an organization and a substantial sum was subscribed to start an educational campaign. One of the first duties of this organization would be to launch a national advertising campaign with the idea of calling attention to the many merits of genuine mahogany and to warn the general public against substitutes masquerading under the names of "birch mahogany" and "mahog any finish." R. S. Huddlestone acted as chairman of this new organization, which is to be known as "The Mahogany Association."

DISSTON SALES MANAGER DIES SUDDENLY.

Only one incident occurred to mar the happiness of the 24th Annual Convention of the National Hardwood Lumber Association, held in Piladelphia, Pa. This was the death of E. F. Cooper, Mill Goods Sales Manager for Henry Disston & Sons, Inc. Mr. Cooper had at tended the annual banquet of the association, held in the Bellevue-Stratford Hotel, on Thursday evening, June 9th. He engaged a room for the night at the Manufacturers' Club. Friday morning, June 19th, at about eight o'clock an attack of acute indigestion caused Mr. Cooper to telephone for a doctor. He was dead when the doctor arrived.

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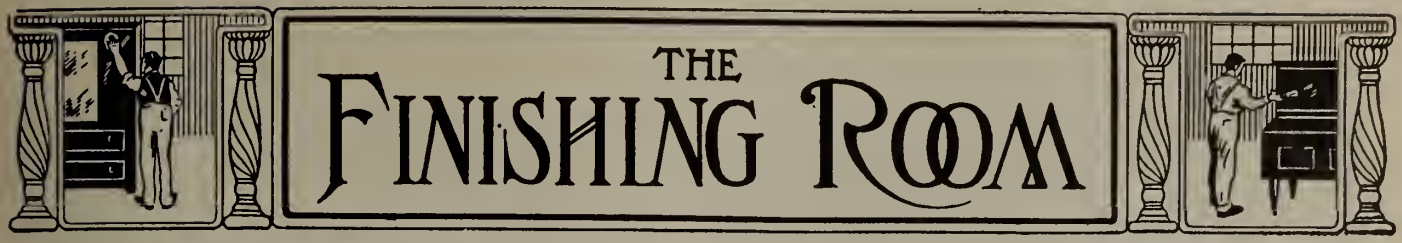

Finishing by Acid Method

Acid Hardens Shellac Giving Durable Finish Improvement Over French Polishing

In the manufacture of cabinet furniture in particular one notes that the goods from foreign sources, the French, English and German specifically, bear very distinct features, so that the expert in such matters is able to tell at once their origin. Design, construction and finish are noticeably different in each case, and as to the finish, that is especially distinct.

With the French finisher originated the polish finish known as French, or, as it is usually written, French polishing. The German finished employed this same method for some years, though in a somewhat different manner; this difference consisted in the generous use of pumicestone and rubbing in the start of the work, whereby they got a perfectly level surface, which was very much thinner in body than that made by the ordinary method. But this was used only on high-grade goods, such as would warrant the increased expenditure of time and labor.

Advantages of Acid Method.

The German also used a purer spirit for dissolving the gum, and from this one might reasonably conclude that the finish would be more durable than that ordinarily produced, both by the French and the English (who also adopted the French-polishing method), and also that the finish would be more excellent, owing to the greater amount of work put upon it. That this was not the case cannot be ascribed to the manner of application, for it is presumable that these three countries, equally famous for fine work, used the same method and about the same kind of materials.

That one may determine the source of manufacture of the three lines of cabinet work or furniture by the finish may seem doubtful, yet there is a mystic something in the appearance of each that tells the story. It is impossible to describe it in words, but there is a difference in the effect seen.

It is now in order to say something concerning the matter of using an acid in the finishing, as the title of this article suggests. It originated with that technical and scientific race, the Germans. But first let us note that in the work of wood finishing and polishing it is unfortunately necessary to employ some oil, just a little, it is true, yet enough to cause trouble to the finish. In the distribution of the polish liquid it is necessary to use oil, owing to the nature of the polish, which is made up of gum shellac, and in some cases with the addition of some other gums, all of which are dissolved in alcohol, and the composition is, from its spirit nature, short and hard to work without the help of the oil.

Used in the greatest degree of moderation, there would still be some difficulty, but when used as it is by some careless workmen, in order to make the work of spreading and rubbing easy, the result is very bad. Some gums work stickier than certain others; then some brands of alcohol will work very much better, or easier, than others, requiring the minimum quantity of oil; other kinds of alcohol, even though the same grade, say grain spirits, will cause the polish to work hot and dry, as the workmen term the effect. The result in the latter case is seen in the too rapid drying out of the polish, leaving the finish dead, and the oil enables it to clear out bright and fine. But too much oil must be avoided.

Increases Durability.

Just here we may observe that in the use of an oil it has been found that poppy oil does rather better than linseed oil. But no mater what oil, there is sure to be enough left on the work, either under the polish, or mixed with it, to cause sweating in time. In most cases, as it works out, the oil breaks up the shellac film into an appearance similar to cobwebs, looking like cracking of the surface. Now, unless this effect is cleared off immediately, these lines or marks will get hard, in the form of minute ridges, which will catch the dust as you clean the surface.

The oil does not, of course, dry quickly, as the polishing liquid does, and the condition of the weather, too, may influence the result by retarding the drying of the oil. Here, then comes in another trouble for the finisher. The appearance of a very slight degree of heat, continued for a few days, as in summer, will suffice to soften the shellac, and as it softens up again it sinks into the wood, on some kinds of wood to the extent of forcing the filler out. Finally, the effect thus produced is that which one might expect when done by an inexpert workman, for the work will have an unfinished appearance. This is particularly to be observed on work faced with very thin veneer.

Conceding, as has been suggested, that the German workmen used a superior grade of spirits, yet they did not entirely escape the difficulty which we have just described. But they were not long about discovering a practical way of overcoming the trouble. This way, to a very great extent at least did overcome the evil; it was known as the vitriol finish, or acid finish. While this was certainly a great achievement, yet it only partially accomplished the purpose that it was designed for. It made no provision for the sinking in and loss of gloss caused by a wave of heat or by the overheating of the room with gas or coal fires Neither did it prevent the perishing of the polish, when a humid condition prevailed.

Build Varnish Body.

Recognizing the extent of the inefficiency of the acid method, the German went one step farther, by doing away with shellac finish on all high-grade goods and employing instead successive applications of copal varnish. Each coat of this varnish was given ample time for drying and becoming hard, in order that the surface might be sufficiently hard to permit of rubbing down to a perfect level with felt pads, using flour pumicestone and water. This operation was repeated four or five times, after which the French-polishing

began. The lusterless surface was treated with a polish formed from bleached shellac, dissolved with a very little more oil: than is generally used in the regular French-polishing process.

This sort of finish may very properly be termed the polish on varnish finish. But there is a difference that should be noted here; the application of the polish is not carried out to its fullest extent; that is to say, the final luster is not obtained by the spirits alone. The polishing is proceeded with to a stage when it is just ready for clearing out the oil and bringing out the lustre with spirits. Instead of using this, the work is pounced rather liberally with precipitated chalk. Then, having at hand a suitable vessel containing sulphuric acid diluted with about ten parts of water, the workman dips the palm of a perfectly clean hand into the acid water, and with this he proceeds to rub the precipitated chalk with a circular motion, applying enough of the acid to cause the chalk to assume a creamy paste form; he continues rubbing, using the finger tips to get the creamy chalk well into the corners and into the moldings, until the chalk becomes dry. Then the final lustre is produced by hand-polishing. The acid possesses the property of hardening the film of shellac, while the chalk brings away any oil that may be upon the surface; it also serves as a polisher.

It will no doubt occur to the interested reader that dipping one's hand in sulphuric acid, even when diluted with water, may not be free from certain pos sible ill-effects to the cuticle thereof, and where this feeling exists it is good to know that the hand may be saved by the use of a most efficient substitute, a soft quality of chamois leather.

Excellent Finish Results.

From what has been stated in the foregoing article it will not be difficult to understand that the essential principle of this acid process lies in the fact that only a small proportion of shellac is employed. Hence there is a lessened liability of a great degree of the softening thereof. Then the successive coatings of hard copal varnish, rubbed and made smooth, entirely prevent the oil from entering the wood or filler beneath. Hence sweating is about prevented.

Finally, let us note that the method brought about an entire change of the method of imparting color to the work, in staining, for the coloring or staining must be done before any varnish is applied. otherwise it would be rubbed off, especially along the edges, when rubbing down with the pumicestone and water, with felt pad. In the real French-polishing the color is applied with the polish, but were we to do that in the acid method, where the color would have to be placed on the copal varnish surface, the acid would bleach the color, unless the acid were extremely dry; aniline colors especially would be thus affected.—"Veneers," Indianapolis.

ASCERTAINING STEAM CONSUMPTION OF KILN

A very simple arrangement for ascertaining steam consumption in a kiln is used by a large American woodworking firm. For several years it has periodically weighed all the condensation formed in a kiln during the whole drying cycle of a particular species or grade of lumber, often a period of six days and nights.

In order to do this it cut the heads from two iron oil barrels; put a drain valve in bottom of each; then connected each trap on the kiln to be measured (it uses a separate trap on each header, or three to each kiln) with a rubber hose so it would discharge into the barrel. As soon as first barrel is full (say fifty-two gallons) time is noted and the hose is changed to the second barrel. Time used in producing fifty-two gallons of condensation varies from six to forty-five minutes, but night and day this time is accurately noted for the entire drying cycle.

Given the gallons of condensation produced in a period of four or five or six days, the balance is simple arithmetic. First take the average temperature of discharge water (about 200 degrees) and allow weight a gallon at 8 to 8.25 pounds, according to tables. This gives total pounds for condensation for period. From this basis we figure the horsepower an hour used to dry the lumber. The pounds of steam used to evaporate the moisture from a weighed crib and much other instructive data are obtained, which all assist in producing good, thoroughly dried lumber.

The days of hit-or-miss kiln drying are past; lumbermen have ceased figuring that a bunch of steam pipes in a building will automatically dry lumber without tremendous degrade. On a kiln operator's knowledge of the exact condition of the circulation and drying condition of the lumber at every stage depends the quality of the lumber produced. All tests of both circulation and humidity must, of necessity, be made inside the kiln with the doors closed. With temperatures around 200 degrees and heavy humidity, this is very unpleasant, and it is mainly these unpleasant conditions which cause many kiln operators to take for granted that conditions are right, when actually the lumber is laying dormant, or casehardening through lack of humidity, preparatory to coming out checked, stained or kiln burnt.

Therefore all the knowledge an operator can gain relative to amount of heat to which the lumber in all parts of a crib is subjected, and the variations in speed of drying caused by movement of lumber, is all too little on which to base any definite statement as to conditions and chemical changes which take place in the lumber, but constant observation inside of kiln helps considerably.

RAW MATERIAL MARKET.

The prices below are taken from reliable current market reports. They are not quotations, but facts—that reflect the trend of the raw material market.

Linseed Oil, single bbls	gals.	$0.80 to .84
Turpentine, last Savannah	gals.	.75 (firm)
Naptha	gals.	.19¼ to .23
Den. Alcohol 188°	gals.	.40 to .50
Benzol	gals.	.30
Toluol	gals.	.33
Gum Shellac—T. N. Orange	lbs.	.70 to .75
Gum Shellac—Bone Dry Bleached	lbs.	.80 to .81
Lead in Oil	lbs.	.13
Lithopone	lbs.	.07¼
Zincs (Green Seal)	lbs.	.11½
Varnish Gums		Weak, except Kauri
Rotten Stone	lbs.	.02½ to .04½
Pumice Stone	lbs.	.03 to .08
Colors		Firm
Tin Cans		Slight reduction
Rubbing Oil	gals.	.30 to .40
Tow (Jute)	lbs.	.07½ to 09½
Sea Grass	lbs.	.04¾ to .05

Lumber—Market stiffening.

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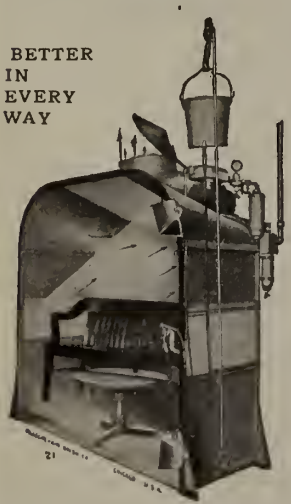

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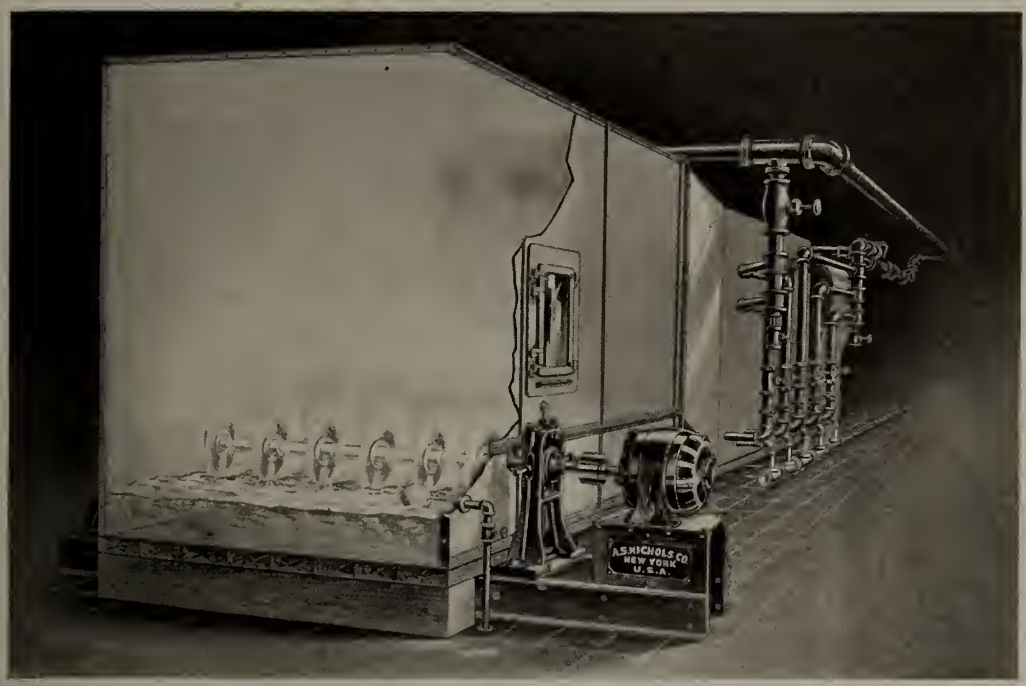

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Veneers and Panels

Science of Moisture Control

Equilibrium Moisture Content Correct Basis — Wood Moves Only When Absorbing Moisture or Drying

By J. F. Hirt, Forests Products Engineerng Co., Chicago

The title of the subject, which your secretary has permitted me to select, indicates to my mind by far greatest cause for the many difficulties and astounding losses encountered in the manufacture and use of lumber and veneers.

Unquestionably the greatest stimulus toward the solution of these important problems was created by the government through the U. S. Forest Products Laboratory at Madison, Wis. Uncontrovertible facts now make possible a full solution of the many problems encountered, and provide a fundamental knowledge with which to proceed and prove in practice much that has been unknowingly and unjustly termed "imprac tical theory."

In order to make this discussion as clear as possible to everyone, I have deemed it advisable to construct a foundation of facts, some of which may seem more or less elementary to those among you who have studied this important subject.

It is a well-known fact that a single fibre of wood will not change its shape to any appreciable extent unless it imbibes moisture when it will expand, or unless it gives up moisture, in which event it will shrink. It follows then that the degree of expansion or shrinkage of the single fibres in a board or piece of veneer of any particular size. The thermal expansion and contraction is so slight that for our purpose we can ignore it entirely.

We first must deal with the natural, inherent moisture of our timber as it is manufactured into lumber or veneers. In manufacturing veneers this problem is more simple, since you receive your logs nearly green from the tree and, therefore, practically all shrinkage resulting from evaporation of moisture is within your control. To take advantage of this requires thorough knowledge of what takes place in lumber and veneers while the moisture is being reduced.

How Moisture Is Held.

Many manufacturers express astonishment when they learn that some species of wood contain 200 per cent. moisture in their green state. Certain species contain even more, 250 per cent. being near the limit.

This moisture is contained in two known forms: Free and fibre moisture. The former is contained in the open cells or pores of the wood and constitutes the bulk of the total moisture. The latter is contained in the actual fibrous structure of the wood, and, with the exception of a few species of wood, can be safely stated to be about 30 per cent.

A sharp distinction must be drawn between free and fibre moisture since all the shrinkage occurring in the elimination of moisture occurs during the reduction of fibre moisture, and after the free moisture has been evaporated. This is quite general, but there are, however, a few exceptions to the rule with which we will deal here. Expansion of dry lumber and veneers can only take place when the moisture content is raised, but again, no further expansion takes place when the fibre saturation, that is 30 per cent., has been reached. We now reach the conclusion that all so-called "working" in wood takes place during changes of moisture content between oven dry and up to 30 per cent., or fibre saturation, with the exceptions previously mentioned.

Just what chemical and certain physical changes take place during moisture changes is not definitely known but we are really more interested in the structural changes and this has now been solved to a near state of perfection.

The fundamental principles of reducing and controlling moisture in veneers are identical with those applied to lumber, the only practical difference being that lumber requires more time and in approximate ratio to thickness. In working lumber you purchase your waste by cutting off the checked ends of boards and planing a 4/4 in. piece down to 5/8 in., if it will not make 11/16 in. or 3/4 in. core or other dimension stock. With veneers you lose through checking and principally through severe "buckling" and consequent breakage.

Guessing Not Permissible.

In the past we have talked of kiln drying lumber in terms of time in days required to dry a certain kind and thickness, without knowing the moisture content of the stock before placing it in the kiln, either guessing at the final moisture content, or, as in many other cases, making erroneous tests. Very few manufacturers are donig this correctly at the present time. Much less is being done in the control of moisture in veneers. They are usually died by mere guess work, and herein lies perhaps the greatest source of loss.

It is decidedly incorrect to reduce veneers to an oven-dry state, because they cannot possibly remain flat when they again imbibe moisture. Considering the fact that any piece of lumber or veneer is made up of innumerable fibres and that these are distributed very non-uniformly, at the same time accepting for the moment the theory that any one fibre has approximately the same power to imbibe and give up moisture as another, it becomes quite apparent that board and, more especially, a sheet or piece of veneer, cannot possibly remain flat during moisture changes unless it is held or rather stressed into a flat position. Naturally the particular spot in an over-dried piece containing the greatest number of fibres, in other words, the most dense spot, will take on the greatest amount of moisture and thereby very obviously will produce local expansion, more commonly known as a "buckle."

No doubt you have all noticed a greater depression around a knot in a dried board. This is undoubtedly due to a greater density of fibres around the knot, each

having given up its own share of moisture and consequently proportionately greater shrinkage has occurred. This is a somewhat exaggerated example of the non-uniform density of timber and, for that matter, a sheet of veneer may have no knots at all and yet "buckle" beyond a point to which it would be practical to use it without further treatment.

Tendency to Warp.

Other causes of unequal shrinkage are due to the natural general formation of fibres in the tree A very good example of this can be observed in any telephone line pole. This shrinkage is evident in the form of large checked openings on the outer surface which grow smaller toward the heart of the tree. A single board, cut from any particular portion in the tree and left to dry out without piling or providing some other method to hold it in a straight position while drying, will shrink very nearly as indications would suggest in the telephone line pole. This indicates two directions of shrinkage which we need to consider here; they are commonly known as radial and tangential. For practical purposes longitudinal shrinkage need not be considered except that it must be recognized in panel constructions known as concealed or exposed crossings and in all banded types. The radial direction in a quartersawn board is with its width, while the tangential direction is through its thickness Lumber shrinks approximately twice as much in the tangential direction as indicated in telephone line pole example

Since the wood is quite elastic, it is entirely possible to dry it in a straight condition without producing any other ill-effects aside from natural shrinkage. In other words, lumber and veneers must be held and stressed in a straight, flat position while the moisture is being reduced to exact requirements.

The solution of this problem lies in having at all times an exact knowledge of the atmospheric conditions throughout the drying period and during the process of manufacture. It is common knowledge that oven-dry lumber and veneer will imbibe or pick up moisture from the air but to be exact we must know just how much it will pick up. When the product ceases to give up or take on any further moisture it is said to be in equilibrium with the atmosphere. An impirical term which we have coined for this condition is E. M. C., meaning Equilibrium Moisture Content.

Equilibrium Moisture Content.

It is well recognized that the E. M. C. changes not only from one season of the year to another and would be different in various localities, but also needs to be known in the individual plant however, it is entirely practical to work out standard drying and moisture control practice based entirely on this condition.

Once you have determined the average E. M. C. in your plant, you know definitely to what moisture content your stock must be reduced. Adjustments may need to be made during seasonable changes, especially in the colder climates where we are required to reduce the outside atmosphere already low in relative humidity, by heating it to a comfortable working temperature in the plant.

Some consideration must also be given the nature of the product, its use and where used, so that under certain circumstances it would be advisable to control the E. M. C. during the entire year. This would not, however, be common practice, since there is another factor working in our favor at all times, which is the particular type of construction used in panels, furniture, and, for that matter, all wood-work composed of more than one piece, which will permit balancing of stresses, shrinkage and swelling.

In establishing the E. M. C. for your particular plant and product, it is first necessary to make extensive tests. These can be made by taking a number of oven dry cross section pieces of 4/4 in. board about ¼ in. in the direction of the grain and suspending them in different rooms in your plant. After a few days they can be tested in the same manner as ordinary tests on lumber would be made to determine the moisture. The results of repeated frquent tests will permit you to work out an average E. M. C. which can be generally maintained at least during our extreme opposite seasons, summer and winter, providing, of course, that your entire product, or a valuable portion thereof, is not shipped to an extreme climate, in which event the E. M. C. would need to be adjusted to make up for at least a portion of the change. As an example, a manufacturer of furniture whose plant is located in Denver, Colo., where the E. M. C. in the open is very low, would get into much difficulty if he shipped his product overseas, unless he made provision to hold the moisture content of his material and finished product proportionately higher. I do not mean by this that the product would need to contain anything as high as the E. M. C. on ship-board as this would be 18 per cent. or more. The exact E. M. C. in this case would be dependent upon conditions at final destination, the construction of the product and its intended use.

(Concluded in August issue.)

Australian Artificial Veneers

A recent Australian invention of an artificial composition similar to veneer should be of interest to manufacturers in proximity to large supplies of waste material of vegetable origin, such as sawdust, says Commerce Reports. As patent applications are pending in Australia and other countries, the inventor is at present reticent in furnishing details other than that the substance is worked up entirely from waste fibrous products and other vegetable matter, and that sawdust can be utilized in considerable quantities in the manufacture of the cheaper grades of the composition. The Canadian trade commissioner at Melbourne describes the product in the following terms:

The substance—named "Keltona"—can be used for a variety of purposes, such as chair backs and seats, furniture generally, veneers and wall and other panelling, and can be produced to represent excellent marble effects. It is capable of being bent freely for a variety of commercial purposes, worked with tools, sawn, bored, planed, sand-papered, etc., and will take nails with ease.

SAWDUST FOR GRAPE PACKING.

Californians who pack table grapes for shipment have shown preference for redwood dust and made large use of it, but the supply may fall short, and as a provision against emergencies experiments have been made with sawdust of other kinds. Satisfactory results have been obtained from spruce dust; and results only a little less satisfactory have been obtained from Douglas fir. Sitka spruce, the species from which most of the sawdust is obtained, grows principally in Oregon, Washington and northward, and the dust must be hauled 500 to 1,000 miles to reach the principal centres from which grapes are shipped. The average haul is twice as long as that of redwood sawdust.

OAK MAHOGANY CIRCASSIAN MAPLE

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OAK MAHOGANY CIRCASSIAN MAPLE

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Rotary Cut Birch and Gum

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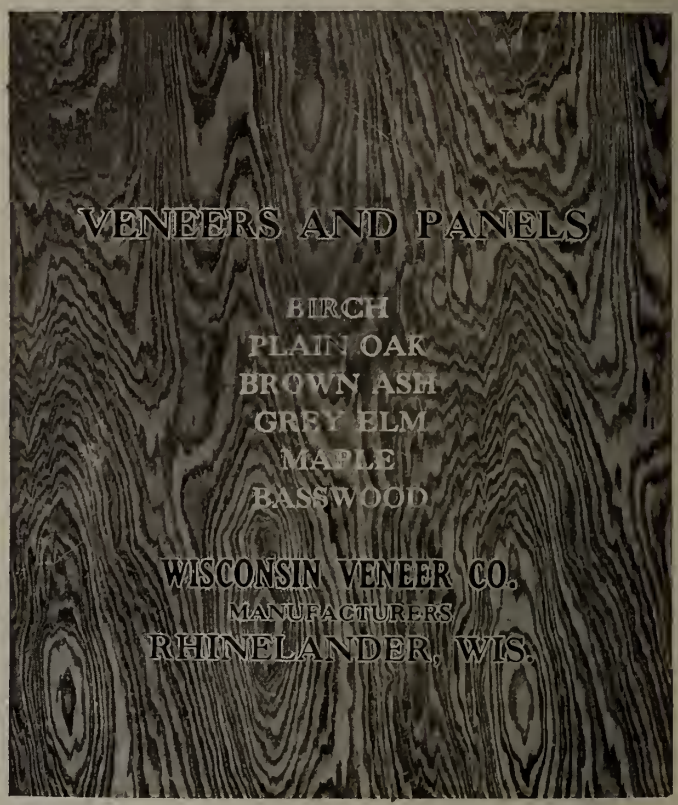
Plywood Dept. Warren, Pa.

Cutting Mill Salisbury Center, N.Y.



Litton Veneer Co.

Manufacturers

American Walnut, Figured Gum, Sliced Quartered Oak, and all Kinds of Figured Woods

Walnut and Quartered Oak Lumber

Office and Mill

ROCKFORD - ILLINOIS

J. W. Frye Lumber and Veneer Co.

Dayton - Ohio

Manufacturers and Wholesalers

Specialize in

Walnut Lumber and Veneers

Oak Lumber and Veneers

Also All Native Hardwoods

Guarantee all stocks to be Ohio and Indiana grown

Logging in Indiana

A Link in the Hoffman Chain of Service------

Reg. U.S. HB *Pat. off.*

EST. 1867
INC. 1904

For over fifty years the HOFFMAN family have operated mills in Indiana, building up a reputation for fair dealing and superior service. To-day the best timber is at our command and a huge fleet of trucks is necessary to carry the logs to our mills. HOFFMAN quality has now become a tradition carefully preserved and upheld.

We know the needs of the buyers and we have made it our study to fill them. We specialize in Northern Grown Oak, American Walnut and Hardwoods; Veneer, sawed and band sawed, and rotary cut Poplar at our Burnside, Kentucky Mill.

Take advantage of this service we offer you to-day.

HOFFMAN BROS. COMPANY

Fort Wayne, Indiana

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Western Office, 516 Lumber Exchange, MINNEAPOLIS, MINN. Mills at GLADSTONE, MICHIGAN

The Northwestern Cooperage & Lumber Co., Gladstone, Mich.

THE HOME OF "PEERLESS" STANDARD BRAND PRODUCTS

Manufacturers of

"PEERLESS" ROTARY CUT VENEERS

in Birch, Elm, Basswood, Maple, Ash and Beech for all purposes

Also hoops, liners and staves for manufacture of packages

Also "Peerless" Rock Maple, Beech and Birch flooring; Hemlock lumber; Lath, etc.
"Peerless" products are standard everywhere and you are always exercising Safety First in using them. Try us next time.
(When writing mention Canadian Woodworker)

VENEER MANUFACTURERS COMPANY

1036 W. 37th Street, Chicago, U.S.A.

A VENEER FOR EVERY PURPOSE

Rotary Cut, Sliced or Sawn, Figured and Plain,
Domestic and Imported—

All Ready to go on Receipt of Your Order

Orders by mail or phone receive the same attention and careful selection they would have were you present in person.

Send for THF VENEER PRICE-STOCK LIST. *2 per cent on regular terms. No charge for cartage.*

100% EXCELLENCE

Manufacturing
High Grade ROTARY CUT VENEERS
Specializing BIRCH DOOR STOCK,
MAPLE PIANO PIN BLOCK STOCK

Years of Experience Behind Our Products

The Munising Woodenware Co.
MUNISING, MICH.

WE HAVE A COMPLETE STOCK OF 3 and 5 PLY PANELS IN VARIOUS WOODS AND THICKNESSES FOR QUICK SHIPMENT

Also offer 3/8" 3 ply Fir s-2-s Panels for Drawer Bottoms and Backing.
1/8" Rotary Cut Northern Red Oak
1/8" Rotary Cut Northern White Oak.
1/8" Birch Veneer 6 to 36" wide 60 to 86" long.
Panels also made to your dimensions.

Write for Prices

GEO. L. WAETJEN & CO.
Milwaukee - Wisconsin

Two Generations of Honest Business

have resulted in the upbuilding of a veneer and lumber organization which we now feel many buyers may be interested in. The history of this business, which during forty years has been producing a line of highgrade Oak Veneers, Hardwood and Yellow Pine Lumber is inseparably linked with the best traditions of the famous hardwood operations of Indiana. Its facilities pictured herewith are a monument to successful and honest business. These facilities have been sufficiently expanded so that we are now pleased to announce to the consuming trade our ability to handle the business of a few more discriminating buyers. This announcement is especially directed to those who will appreciate relations with a producing organization which long since earned its reputation for strictly reliable product and service.

F. M. BACHMAN COMPANY
INDIANAPOLIS, INDIANA

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

QUALITY *SERVICE*

PICKREL VENEER COMPANY, Inc.

MANUFACTURERS OF

American Walnut

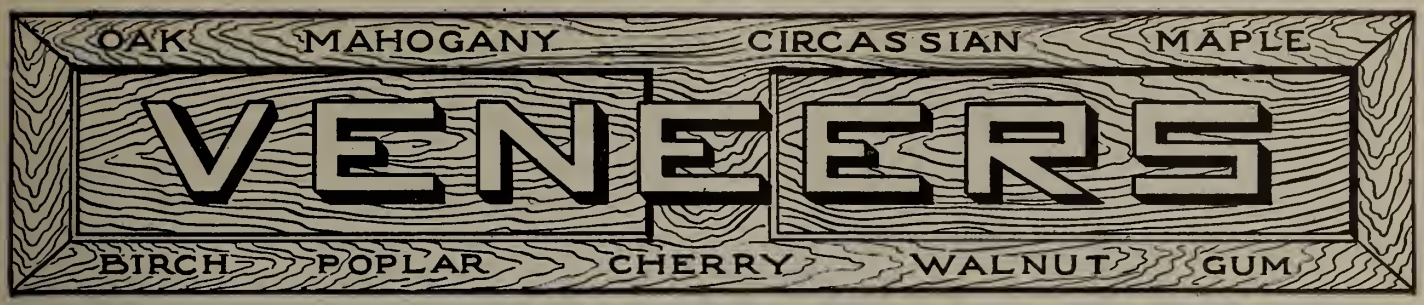
Exclusively

Woodruff and River *New Albany, Ind.*

Buyers of Veneers and Panels

will find it to their advantage to purchase from the manufacturers and dealers whose advertisements appear in this publication. They are progressive firms—the leaders in the business, which is a guarantee of good service and prompt attention to orders.

Give your business to the man who will spend his time and money to get in touch with you. He deserves it—if his stock and prices are right.



INVESTIGATE

P.-J. SERVICE

For high-grade rotary cut veneer, that is smooth and evenly cut and dried by mechanical means to any percentage of moisture desired.

We also operate large band mills where all kinds of southern hardwood lumber is cut from our own tract of timber in the very heart of the Saint Francis Basin District, Arkansas.

PENROD-JURDEN COMPANY

A Name that Should be on your Enquiry List for both Veneer and Lumber

Mills at Helena and Penjur, Ark. General Offices: Memphis, Tennessee.

Penrod Walnut and Veneer Co.

KANSAS CITY, MO.

Exclusive Manufacturers American Walnut Lumber and Veneers

AMERICAN BLACK WALNUT LUMBER

FAS—6-9¼" Wide, 8-16" Long

3/8"	3,750	Feet
1/2"	21,470	"
5/8"	44,140	"
3/4"	25,962	"
4/4"	82,502	"
5/4"	26,766	"
6/4"	39,201	"
8/4"	33,140	"
10/4"	14,245	"
12/4"	11,470	"
16/4"	3,700	"

FAS—10" and Up Wide, 8-16" Long

1/2"	9,680	Feet
5/8"	18,980	"
3/4"	14,430	"
4/4"	48,872	"
5/4"	14,165	"
6/4"	10,262	"
8/4"	16,920	"
10/4"	10,250	"
12/4"	1,800	"
16/4"	2,100	"

Fas—6"and Up Wide, 6-7 Feet Long

3/8"	1,200	Feet
1/2"	5,790	"
5/8"	840	"
3/4"	8,940	"
4/4"	32,400	"
5/4"	2,300	"
6/4"	7,800	"
8/4"	1,500	"
10/4"	1,400	"
12/4"	500	"
16/4"	400	"

SELECTS

4/4"	32,940	Feet
5/4"	27,530	"
6/4"	21,480	"
8/4"	33,590	"
10/4"	16,850	"
12/4"	6,054	"
16/4"	1,332	"

NO. 1 COMMON

3/8"	8,000	Feet
1/2"	27,380	"
5/8"	29,850	"
3/4"	31,285	"
4/4"	59,675	"
5/4"	38,240	"
6/4"	18,750	"
8/4"	39,240	"
10/4"	16,363	"
12/4"	4,768	"
16/4"	1,604	"

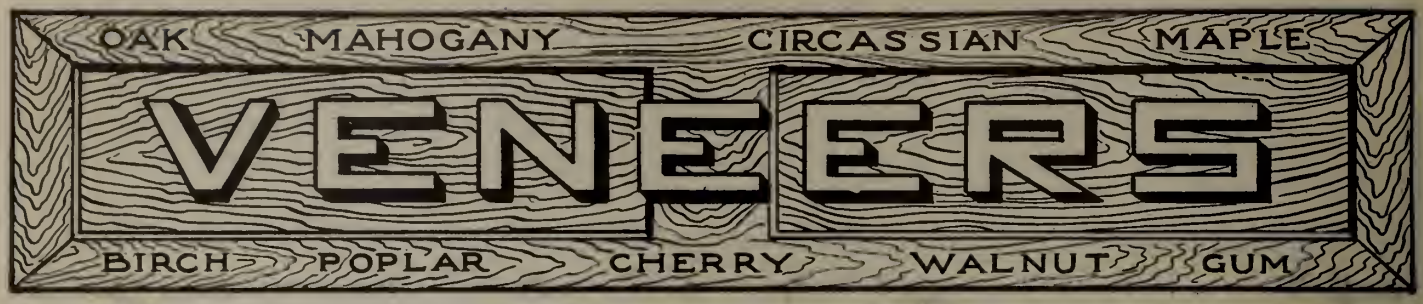
NO. 2 COMMON

3/8"	1,500	Feet
1/2"	1,900	"
5/8"	4,500	"
3/4"	2,190	"
4/4"	72,250	"
5/4"	47,890	"
6/4"	31,720	"
8/4"	35,940	"
10/4"	19,140	"
12/4"	20,116	"
16/4"	16,088	"

Write for prices on any items you are interested in *"PENROD SERVICE" Satisfies*

C. A. Rugg, 115 Foots Avenue, Jamestown, N. Y., Eastern Representative.

Geo. C. Hall, 610 South Michigan St., Representative for Chicago and Michigan territory.



Poplar and Walnut
Veneers

We specialize in large size poplar veneers as we have extra fine poplar logs. We can cut veneer up to 10 feet square.

Our walnut veneer cannot be beat, both in plain and figured wood.

Write us for prices.

Central Veneer Company
Winter Ave. and Belt R. R., INDIANAPOLIS, IND.

Sovemanco
Southern Veneer Manufacturing Co., Inc.
LOUISVILLE, KY.

Importers and Manufacturers of all kinds of Sawed, Sliced and Rotary-cut

VENEERS

CARRYING

a large stock of selected Mahogany, Figured and Plain Walnut, Walnut Butts, Sawed and Sliced Quartered Oak and Sycamore and all other native woods.

1,000,000 Feet
QUARTERED RED GUM
to select from

WE Respectfully solicit your inquiries

C. E. CURTIS & BRO. CO.
2422 S. Western Ave.
CHICAGO, ILL.

SUPPLYING HIGH GRADE

Veneered Panels

IN ANY SIZE, THICKNESS OR KIND OF WOOD

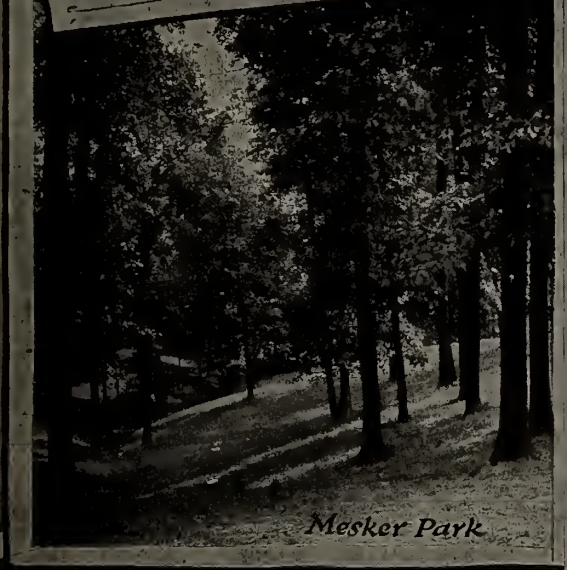
Immediate Shipment on all Stock Sizes in Walnut, Plain Oak, Birch, Mahogany, Etc.

Wide Veneer

One carload of 1/20″
Quartered White Oak
Sawed Veneer
12″ and wider

Ready for Quick Shipment.

Memphis Veneer & Lumber Co.
MEMPHIS, TENN.



Evansville
is substantial and progress-ive and we are proud of our city.
We are proud of our plant, our product, and our reputation.
A repetition of merit, service and quality together with a capacity to serve made us-what we are.

Evansville Line
Quartered Oak
Sliced Walnut
Figured Red Gum
Plain White Oak
Rotary Cut Gum

THE Evansville Veneer Co.
MANUFACTURERS OF
VENEERS.
EVANSVILLE, IND.

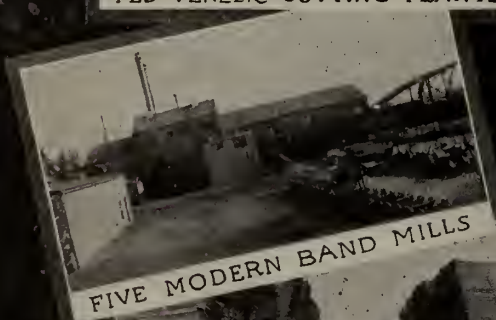
Some Reasons why Wood Mosaic Quality is Consistently High

SPECIALLY DESIGNED DRY KILNS WITH 500,000 FEET MONTHLY CAPACITY

THE MOST PERFECT POSSIBLE VENEER DRYING EQUIPMENT.

A LOG SUPPLY SELECTED BY 20 EXPERIENCED BUYERS

PERFECTLY BALANCED AND EQUIPPED VENEER CUTTING PLANTS.


FIVE MODERN BAND MILLS

THOROUGH CARE AND EXPERIENCE IN HANDLING LUMBER

An organization complete in all details is a guarantee of correct product if properly operated.

Some organizations grow haphazard, expanding here and there at random and making impossible a co-ordinated whole. The operations of the Wood-Mosaic Company function with precision because every step has been part of a well-conceived plan. The basic thought is a plant for each type of production. Thus, every foot of Wood-Mosaic hardwood lumber and veneers in walnut, oak and poplar is produced in a plant designed especially for the manufacture of each class of product.

This holds from the logs, which are the careful selection of a trained corps of twenty timber buyers, through the final operations of handling the manufactured product, special equipment having been provided for each unit of manufacture so that the lumber and veneer product may be always correctly dried and further prepared for consumer's use. We solicit the opportunity of demonstrating the value to you of such an organization.

WOOD-MOSAIC COMPANY
(Incorporated)
LOUISVILLE, KENTUCKY

Chicago Representative:
GEO. W. STONEMAN & CO.,
845 W. Erie St.

Grand Rapids Representative:
HECTOR ROBERTSON, 232 Lyon St., N.W.

WOOD-MOSAIC CO., INC., LOUISVILLE, KY.

ALGOMA *the Better* Plywood

Credit where credit's due!

Credit for originating stock sized panels belongs to the Algoma Panel Company. This idea, now widely used, has saved manufacturers many dollars by saving on costs of production through standardization.

Credit for increased profits can be entered on your books by the adoption of Algoma stock sized panels. ALGOMA, THE BETTER PLYWOOD, is made up ready for delivery in panels of the following stock sizes:

24 in. x 60 in.	3-ply ¼ in. thick	24 in. x 72 in.
30 in. x 60 in.	5-ply ⅜ in. thick	30 in. x 72 in.
36 in. x 60 in.		36 in. x 72 in.

This is only one of the many ways in which the interests of our customers are served. You can secure the benefit of our 35 years of careful manufacture by adopting Algoma the Better Plywood, for every purpose. Let us give you estimates.

ALGOMA PANEL COMPANY, *Algoma, Wis.*

Peculiarities of Quartered Oak Veneers

Ruptured Fibres Not Confined to Rotary-cut Material — Each Wood Presents Different Problems — Good Results Require Close Attention to Every Minutest Detail

By R. N. Y.

The majority of troubles encountered in the different veneering operations look simple enough, but when we attempt to remedy them, we are often confronted with a more difficult problem than we thought possible. It is commonly assumed and is in many cases true, that many of the difficulties encountered are due to the application of rotary cut veneers. For this reason the many articles dealing with the elimination of veneering troubles have dealt almost exclusively with overcoming the troubles common to rotary cut stock. In fact, it has become quite common in some plants to assume that the use of sliced or sawn material is the easiest way of eliminating the troubles referred to. Some go a step farther and consider that certain woods are so easily handled and worked, particularly if they happen to be sliced or sawn, that very little attention is given to the way in which they are handled and applied, with the result that many of what should have been choice pieces of furniture, veneerd with the most beautiful examples of our native veneers, have lost their value because of carelessness in the matching and application of the veneers.

In this article we will endeavor to deal with some of the problems encountered in the application of sliced or quarter sawn oak veneers. One of the contentions in favor of quarter sawn or sliced oak is that this method of cutting does not fracture and break the fibres the same as the rotary lathe. This is not altogether true. Quartered oak veneers are never rotary cut, yet one sometimes finds whole shipments in which the grain has been broken as on the lathe. Part of this may be due to inexperience on the part of the manufacturer or the operators in his plant.

Special Attention to Stock.

Veneer of this kind will give as much trouble from checks, etc., as any kind of rotary cut stock. This holds true whether the material is laid right-side up or not. When handling stock that shows imperfections of this kind, one must take great pains to make sure the best side is laid on top. On a wide face requiring several pieces of veneer, owing to the fact that some of the stock cannot be reversed to secure a good match, considerable pains must be taken in selecting and matching the pieces.

It is said that some of the quartered oak now being turned into sliced veneers should have been manufactured on the veneer saw. This may be illustrated by referring to the hand plane. If you have a piece of quartered oak in which the grain is twisted and appears to be running in all directions, you will find that it is almost impossible to smooth up same without tearing the grain in different parts. In slicing, the work is practically the same. Some manufacturers claim that the percentage of oak logs suitable for sliced veneer is not over 75 per cent. of those handled. The remainder should only be manufactured on the saw. It stands to reason that a plant slicing all kinds of oak logs is bound to produce a quantity of face veneers that should not grade No. 1. Much of this material, when laid, will develop flaking of the splash or figured grain, some of the finest pieces being rendered entirely useless on this account.

Apply Good Glue Size.

In an endeavor to prevent trouble of this kind a good idea, one that has been followed by several large concerns, is to thoroughly examine all panels laid with quartered oak after they have been dried and are about to be taken to the sander. It is easier to distinguish the ruptured flakes and faulty pieces before the sanding has been done. All panels in which defects are found should then be coated with a glue size mixed to the thickness of ordinary buttermilk. When this has dried perfectly the panels may be sanded. If one coat of size is not sufficient to overcome all the trouble, a second application may be made. However, it will be found in the majority of cases that one coat is sufficient.

This same trouble is sometimes experienced with sawn quartered oak face veneers. This usually occurs in a plant using the hot plate type of drier and is caused by handling the quartered oak stock in the same manner as ordinary veneer.

This class of material can be dried successfully in a hot-plate drier, but should be allowed to remain only for half the length of time in the machine and then run through again for a final drying after an hour or two has elapsed. Another way is to cut down the temperature of the plates one-half and allow the stock to remain in the machine double the length of time ordinarily given to common material.

Steam Ruptures Fibres.

The reason for this procedure is that when quarter sawn veneers, containing a high percentage of moisture, are being dried, the steam generated from the moisture in the plates or splash grain is not thrown off as quickly as that generated in the rest of the wood and the result is that the flake becomes ruptured or practically explodes. This is easy to understand when one considers that the fibres of the flake are denser and more solid than in the rest of the piece.

These flakes usually blister up and are readily discernible before laying. In most cases this blister is not much thicker than a sheet of newsprint, and if the veneer is 3/32 or thicker it will generally sand off, leaving a smooth surface. If the blistered side should be laid down, the glue will not be able to get a good grip on the solid wood, and loose spots or blisters will result.

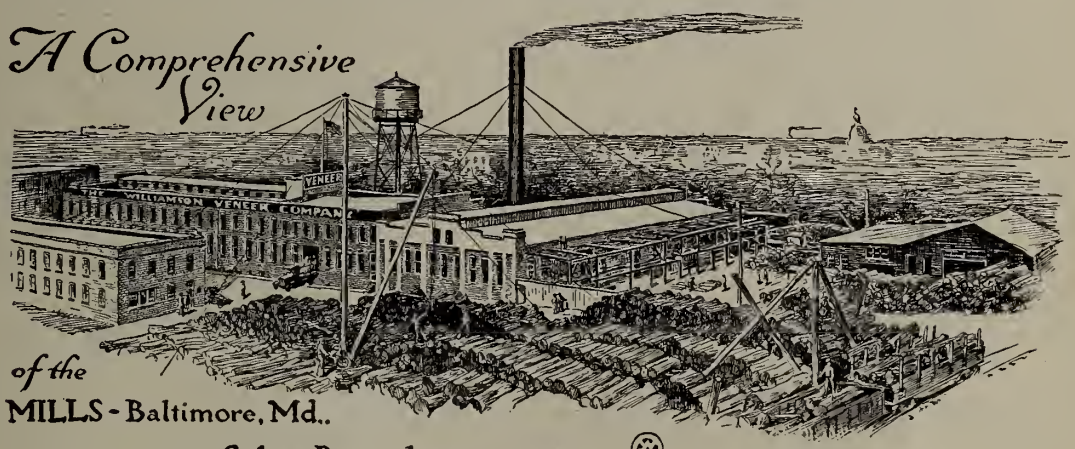
This goes to show that without regard to what kind of veneers are being used, whether they are rotary cut, sliced or sawn, vigilance should be the guiding star of the men doing this work. If this idea is followed much of the trouble so often encountered will be eliminated from the veneer room.

The quality of a belt depends on its power to retain the fastener for the two ends, its suppleness and its evenness of running, combined with a grip like a limpet.

WE would like to take all of our customers over our plant in Baltimore. We know it would interest them to see *how* we produce QUALITY VENEERS in Walnut Butts, Mahogany, Burls, Long Walnut, Oak, Poplar etc.

A "Personally conducted tour" being out of the question, however, for more than a limited number. we will try to give an idea of the plant by means of a series of pictures.

A Comprehensive View



of the MILLS - Baltimore, Md..

Sales-Branches:
709 - Sixth Ave., NEW YORK CITY,
28 - East Jackson Boulevard, CHICAGO,
JAMESTOWN, N.Y. - HIGH POINT, N.C.

The
WILLIAMSON VENEER CO.

VIEWS OF OUR PLANT No. 1. H G W feat

JUNE VENEER AND PANEL MEETING.

Two questions of importance were dealt with at the semi-annual meeting of the National Veneer and Panel Manufacturers' Association, held recently in Chicago. One was the question of freight rates. When the Interstate Commerce Commission started to investigate the rates and classifications of lumber and veneers in 1916 the case of the veneer and panel industries was handled by D. E. Kline of the above association. He presented his arguments and other information in such a clear, unanswerable manner that everything asked for was granted. Before the finding of the commission was put into effect the railroads were taken over by the Government and the matter has been permitted to stand in abeyance since that time.

Under the ruling made by the commission, the rate on veneers were to be the same as on lumber, with fancy face stock 15 per cent. higher. Plain panels were to be rated at 10 per cent. above lumber rates, and fancy panels 15 per cent. above. Were these rates to be put into effect at the present time it would result in a considerable saving in freights on veneers and panels.

The other matter of vital interest to the industry which was discussed at this meeting was the question of publicity. The Plywood Trade Extension Bureau was authorized to spend $50,000 in an effort to broaden the field for veneers and plywood products, and to combat prejudice held by the general public against veneers and veneered products. G. O. Worland of the Evansville Veneer Co. is chairman of the Trade Extension Committee, which is behind the publicity campaign.

It was decided that there would be no necessity of changing the name of veneers. This decision was based upon the wealth of information uncovered by the Research Committee. It was found that veneers had been used with success for centuries. By digging into such ancient chronicles as Pliny, the historian of Rome, and others, photographs were presented, showing the veneering process as far back as the early Egyptian dynasties. It was also brought out that the master furniture craftsmen of both modern and ancient times found veneer the best medium with which to enhance the beauty and value of their product. It was felt that an extended publicity campaign would not only create new and greater business, but would raise the veneer industry to a more dignified plane.

J. F. Hirt of the Forest Products Engineering Co., Chicago, delivered an interesting address on "Controlling Moisture in Lumber and Veneers." Part of this talk appears elsewhere in this issue.

Another step of far-reaching importance was the decision made to work out and put into force a uniform set of grading rules, which might be termed "national rules," for the inspection of veneers and plywood. This move calls for a national inspection bureau and the employment of a qualified inspector to settle disputes with regard to grades and rule interpretations.

From reports presented by those present, it would appear as if a large percentage of the veneer mills have ceased manufacturing and that many of those operating are endeavoring to clear up what stock they have on hand before closing down. Woods operations have practically ceased and from the point of production the industry is at a very low ebb. It is not likely that manufacturing will be resumed before fall and not then unless there is a marked improvement in demand

Chemical Reaction Affects Casein Glue

Although casein glues are highly water-resistant, they ultimately decompose when exposed to a damp atmosphere for a long time. For many months studies have been under way at the Forest Products Laboratory to discover the cause of this decomposition.

The decomposition study is still far from complete, but the conclusion has been reached that the decomposition of ordinary alkaline casein glues is not due to the action of bacteria or molds. It appears to be due entirely to chemical action of the alkali in the glue. This conclusion is based upon the following observations:

Increasing the amount of alkali in the glue increases the rate of decomposition when the glue is kept wet.

Glues containing no sodium hydroxide, although deficient in some important respects, do not decompose as rapidly as similar glues containing sodium hydroxide.

Cultures of molds and bacteria could not be obtained from decomposed alkaline glues.

Some chemicals which have antiseptic properties are found to improve casein glue, but this improvement is due to their chemical action rather than to their toxic properties.

Glues can be completely decomposed in a short time at temperatures above that at which bacteria can grow.

Further work is being directed toward the production of glues which will resist chemical decomposition and at the same time be impervious to the action of fungi and bacteria as well as moisture.

Cheaper Panel Construction

It has been suggested that the use of plywood cores made from heavy rotary stock instead of the ordinary solid core, will reduce the cost of solid panels, ¾ in. and over, and at the same time result in a better product. The idea is that a core constructed of layers of heavy rotary-cut stock, would not cost as much as the lumber required for the solid core, and that a panel made with a laminated core, would give better service, would not have such a marked tendency to warp and buckle, and would stand rougher usage.

The idea is, certainly worthy of consideration. It would require numerous experiments and a careful check on operating time to determine the comparative costs of these two cores. If it should be found that the built-up core can be made for less money than the plywood one, it is, certainly, a step in advance, for there is not any doubt that a panel built entirely of laminated material is superior to one having a solid core.

Should this idea prove practical, it would result in lowering furniture costs, for this laminated construction can be used for bureau and table tops and other places where heavy veneered stock is required.

A good spindle guard not only reduces the chances of a workman cutting his fingers, it helps him to do jobs with a surety that, if anything happens, his fingers will be safe.

It pays to have a set of spanners for each machine Good spanners which fit the nuts should be kept in a cupboard or hanging up on the wall.

VENEERS

The Quality Kind

We carry in stock, for immediate shipment, 3 and 5 ply Panels in Birch, Oak, and Mahogany — sizes 24" and 30" wide, 48", 60" and 72" long.

A complete range of American Walnut, Quartered Oak, Mahogany, Figured Gum Veneers and Rotary Cut Veneers.

It is not uncommon that a really fine piece of furniture has been practically ruined after a few months service because of the poor grade of veneer used. Such happenings do much to harm the manufacturer's reputation. That is why many will not consider anything but the best—usually they insist on Toronto Veneers—the quality kind.

Toronto Veneer Co., Ltd.

1100-1104 Queen St. West, TORONTO, ONT

Walnut, Quartered White Oak and Mahogany Veneers and Lumber

Prompt Delivery

LONG-KNIGHT LUMBER COMPANY

INDIANAPOLIS, IND.

VETERAN WOODWORKER CELEBRATES GOLDEN WEDDING.

Mr. and Mrs. George Gall, 6 Jameson Avenue, Toronto, celebrated their golden wedding on July 15th The venerable couple are still in good health and were the recipients of numerous gifts on the happy occasion.

Mr. Gall is one of the veteran lumbermen of Canada, being now 82 years of age. He still comes down to business and is quite robust. He was married on July 15th, 1871, to Miss Maria Mark at Strichen, Aberdeenshire, and shortly after came to America with his bride, locating in New York for a couple of years and then removing to Toronto.

Previous to his marriage Mr. Gall, who was a carpenter and contractor, had spent some time in New Brunswick, Boston and New York. On returning to this country he formed the McCracken-Gall Lumber

George Gall, Toronto

Co., who took over the business then conducted by John Oliver at the corner of Soho and Phoebe Streets, Toronto. At that time they did a general contracting trade, as well as operating a busy planing mill and woodworking plant, and built a number of cars for the Toronto Street Railway in its early days.

Mr. McCracken passed away and Mr. Gall sold out in 1889. He then formed the Gall-Anderson Lumber Co., his partner being John O. Anderson, now an honored official with the Ontario Government. They established a woodworking factory on Niagara Street where the National Casket Co. is now located, and their lumber yard was on Tecumseth Street, where the present City Stock Yards stand. This partnership was continued until 1898.

Mr. Gall erected a large number of houses in the city and conducted a large contracting business in addition to running a lumber yard. After going out of this line he went into the wholesale lumber business exclusively, forming, some 23 years ago, the Gall Lumber Co. Limited, which had offices in the Confederation Life Building. Two years later one of his sons, Alfred J. Gall, joined him, and in 1905 another son, W. C. Gall, became associated with the firm. The yards of the company were then located at the foot of Bathurst Stret. In 1908 the office was removed from the Confederation Life Building to the foot of Spadina Avenue, where storage sheds and large dry kilns were erected, and the yard transferred to the same site.

During the past few years the Gall Lumber Co have specialized in native and imported hardwoods, and have built up a well established business throughout the Province of Ontario.

Mr. and Mrs. Gall have a family of three sons and five daughters, all of whom, along with several grandchildren, were present at the golden wedding celebration. The sons are W. C. Gall and A. J. Gall of the Gall Lumber Co., and Hugh Gall of Robertson Bros., Limited, Toronto. Many friends will wish the venerable couple many more years of peaceful and contented wedded life.

THE POPULARITY OF CEDAR CHESTS.

When the manufacture of cedar chests became so great that you found a cedar chest in every furniture and upholstery stock in the country other manufacturers began thinking along similar lines and as a result we had old oak chests to go into rooms calling for old oak furniture and mahogany chests for rooms of mahogany—treasure chests trousseau chests linen chests and all of them entering into great competition with the cedar chest. But, somehow or other, they didn't seem to interfere with the sale of cedar chests. We are told by one manufacturer that last year the sale of cedar chests throughout the country ran close to $10,000,000.

The cedar chest has had always one appeal as a moth-repellent which has kept it popular, and it is perhaps for this reason, more than anything else, that sales have become so great, notwithstanding competition with other woods.

New Style French Furniture

A recent despatch from Paris says that a new style in furniture was demanded by representatives of the French furniture industry at the Furniture Congress held recently in the Parisian capital. Architects are blamed by the president of the Furniture Makers' Association for the continued production of false Louis XV., Louis XVI. and other styles of antiques. They design interiors to go with such furniture and naturally the manufacturers have to meet the demand, he says. The president proposed that the teachers in the fine arts school should begin the campaign for a modern original style by inspiring original ideas under the general direction of a committee composed of artists, architects and furniture makers. He hopes this method will produce an entirely new style that will mark this epoch as did the styles of the two Louis, of the Empire and the Renaissance.

THE NEW MAN.

Figures show that the new man on the job is very likely to be hurt. Why not make a practice of showing him any danger spots there may be? Show him the safe way to do his work. If he is also new to any industrial work, take a special interest in him—a word of advice may save him from serious injury. Don't leave him to learn in the bitter school of experience.

It will certainly pay you to try high-speed steel cutters for long runs of mouldings. Be sure that your workmen do not spoil these cutters by overheating them in the grinding.

LELAND G. BANNING

CINCINNATI, OHIO

Our Specialty:

SOFT OAK PLAIN AND QUARTERED

also **MOUNTAIN POPLAR**
WALNUT, ASH, CHESTNUT
OTHER HARDWOODS

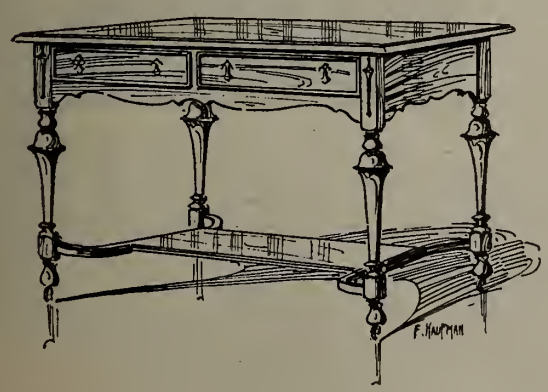
Canadian Representative:
A. E. KLIPPERT,
11 LAXTON AVE.,
TORONTO, ONT.

BAND MILL:
FRANKFORT, KY.

Veneered Panels of the Finest Quality

We have them on hand ready for immediate shipment in quartered oak, mahogany, walnut, plain oak, birch and maple. Thicknesses: 3 ply, ¼ and 5 ply, ⅜ inch. Sizes: 72 x 24, 60 x 30, 60 x 24, 60 x 20, 60 x 18, 48 x 18, 56 x 25.

Made of the finest quality materials and backed by twenty-five years of manufacturing experience. It will pay you to get in touch with us.



Also panels in domestic and fancy woods in quantities cut to size for furniture drawer fronts, drawer bottoms, desk tops, table tops, door panels, interior woodwork, etc., etc.

Hay & Company Limited
Woodstock - Ontario

REVIEW OF COOPERAGE SITUATION.

Some idea of what 1,250,000 feet of logs look like may be gathered from the accompanying illustration. This was taken at the plant of the Trenton Cooperage Co., Limited, Trenton, Ont., and shows some of the logs which are awaiting manufacture. This huge quantity of raw material is unloaded on twenty-seven skidways.

1,250,000 feet of logs on skidways at Trenton, Ont.

The railroad siding, indicated by the loaded cars, is so situated that the logs may be rolled off on either side.

W. A. Fraser, manager of the above concern, in reviewing the situation with regard to the Canadian cooperage industry, says: "While up to the present we have managed to maintain a volume of business equal to, or, in fact, somewhat ahead of the same period for 1920, generally speaking, the situation has not been at all satisfactory to cooperage stock manufacturers. During the past six or eight months the selling price of the different lines of slack cooperage has been cut in two; which, of course, will result in heavy losses, as manufacturers purchased and took out their raw material at the highest cost known in the business. In addition to the cost of stumpage, labor, provisions and horse feed, we have been transporting our timber under freight rates that are 100 per cent. higher than they were in 1914 and 40 per cent. over the rates in effect during the same period of 1920. This all, of course, has added to the cost of production, the only offsetting reduction being 10 per cent. decrease in manufacturing wages since May 1st, 1921.

"The general business conditions in Canada and United States have probably affected the cooperage industry more than any other line. American cooperage manufacturers are to-day offering their manufactured material at less than the actual cost of the logs. As there is a very small tariff protection, cheap U. S. stock has had a demoralizing effect on the Canadian market, for the millmen across the border seem to be willing to part with their product at practically any figure in order to get ready money.

"We have been operating our Trenton plant to full capacity since April first and will cut over four million feet of timber into cooperage stock this season. To effect the heavy rail freights, we have handled a considerable portion of our cut by water this year, and have found cribbing and towing hardwood logs to work out very successfully. We use a gasoline tow boat, which has proved much more economical than steam.

"We installed an 8 in. gum shot feet in our Trenton plant during the spring of this year and find that it has considerably increased our capacity for preparing both our stave and hoop material, but apart from this and additions to our facilities for handling raw material, we have not made any extensive improvements.

"While prospects in the Canadian cooperage trade depend almost entirely on the resumption of general business in the United States, there is a strong feeling among the manufacturers that there will be marked tween now and the 1st of September, as there has really improvements in the market for cooperage stock bebeen no over-production, but simply a lack of buying."

NEWLY ORGANIZED WOODWORKING COMPANY

The Buyers Door & Manufacturing Co., Limited, is the name of the company which has taken over the business formerly known as Batts, Limited. This new development means a change in name rather than a change in management. It is some three years since Messrs. Batt severed their connection with the concern which bears their name. John S. Bond, who has been manager for the past few years, will continue in charge, and will, as heretofore, be assisted by his brother, Thomas G. Bond, as superintendent.

John S. Bond, the vice-president and managing director of the new organization, comes of a family which has been associated with the woodworking and lumbering industries for three generations. He has been actively engaged in this field for twenty-five years, while his brother has had fifteen years' practical experience.

The lines manufactured include veneered and pine doors, columns, newels, frames, sash, flooring, panel-

John S. Bond, Toronto, Ont.

ing, interior fittings, together with general and special woodwork of all kinds. The trade mark "B. L.," which is so well known to the trade, is being retained.

To young men. Don't watch the clock. Work so you can win a good position in the world. You have plenty of leisure for football and pleasure. Keep them outside the mill.

Too much gullet is as bad as too little. It weakens the saw and allows the set to come off the teeth.

ATCo
MEMPHIS
SOUTHERN HARDWOOD LUMBER & VENEER
Adverse Conditions Have Not Affected the Quality of Our Lumber or Service
AT ONE POINT in the development of a modern busines its driving force may keep it going brilliantly while conditions are favorable. Later it gains a solidly established state, imparting a degree of momentum sufficient to maintain the forward movement even under the most trying circumstances.
So with the Anderson-Tully Company, pioneer manufacturers of Southern hardwood lumber, veneer and plywood. Great diffculty in operation has in no way impaired our ability to serve you correctly. The Anderson-Tully Company trademark will always be known where the best in goods and service are most appreciated.
Order from Anderson-Tully on present low prices
ANDERSON-TULLY COMPANY
MEMPHIS
LIVEZEY

News of the Trade

Sims-Till Mfg. Co., Toronto, were granted a patent for a folding bed.

C. W. Van Duzer, Newbury, Ont., contemplates erecting a factory to manufacture berry boxes and heading.

A Federal charter has been granted to the Canuck Tool Mfg. Co., with a capital stock of $40,000, and headquarters in Toronto.

J. H. Vaughan, vice-president of the Lewis Thompson Co., Inc., Long Island City, N.Y., who are specialists in mahogany, spent a few days in Toronto recently on business.

The General Lumber & Mfg. Co., Limited, Sherbrooke, P.Q., are in the market for a new or second hand automatic lathe, together with a quantity of hardwoods.

The Gold Medal Furniture Mfg. Co., Limited, Toronto, held their midsummer furniture exhibit in the Aladdin Building, corner King and Simcoe Streets, Toronto.

A new industry is being established in Hespeler, Ont., in the old lightning rod factory off Bella Street. It is understood that the firm will manufacture handles for forks, shovels, etc.

The Sani Products Co., Limited, of Toronto, with a capital stock of $40,000, has been granted a Federal charter to buy, sell, manufacture and deal in wood, glass, iron and metal furniture.

Work is progressing nicely on the new planing mill and office building being erected by the Conklin Planing Co., Kingsville, Ont. The cost of the new buildings will be in the neighborhood of $25,000.

Wm. Cawkell, secretary of the Furniture Manufacturers' Association, is enjoying a well-earned holiday at Sturgeon Lake. Wihle there he is matching wits with the wily denizens of the lake.

Livingstone Watson of Winona, Ont., died recently at his home there. He was a former resident of Hamilton, where he conducted a cooperage factory for some time. Mr. Watson was about 60 years of age.

A train bearing samples of products made in France will tour Canada during the latter part of August. The purpose of this tour is, of course, to acquaint the public with the quality and scope of French manufactures suitable for sale and consumption in the Dominion.

The Valley City Seating Co. of Dundas recently shipped a large order of church furniture to Hendrina, Transvaal, South Africa. The order, which is the second one the company has shipped to South Africa, included pews and other church accessories.

W. A. Coward, who is conducting a general woodworking business at Hespeler, Ont., is doing hand lathe work at the present time. He intends in the near future to make handles for forks, shovels, etc., and when fully established will specialize in edged tool handles.

The Gove Motor Car Co. of Detroit, Mich., who contemplate establishing an automobile factory in Canada, have purchased a site at Thorold, Ont., and will shortly commence the erection of their plant. A by-law has been carried granting a fixed assessment for a period of years.

The members of the Ottawa Men's Piano Club, with their wives and families, held an enjoyable picnic recently at Riverside Park, Ottawa. Some twenty athletic events were run off for handsome prizes donated by the various music houses of the city. A. W. Brown is honorary president of the club.

Don McKee, Wallaceburg, Ont., expects to commence work on his new planing mill and sawmill in the near future. Most of the material and equipment have been purchased. Walter McLean and Alonzo Phillips are erecting a small woodworking and cabinet shop in connection with this plant. They propose installing a combination woodworker and a handle-making machine.

The planing mill of the East Kootenay Lumber Co., Jaffray, B. C., was recently destroyed by fire. The damage amounts to $50,000. In addition to the plant, about 300,000 feet of choice lumber went up in smoke. No decision has been reached as yet with regard to rebuilding, although it is likely that a new plant will be put up in the near future.

The Canadian Western Cooperage, Limited, has been organized with a capital of $150,000, to take over the various cooperage and barrel manufacturing plants in British Columbia. This company will practically control the entire barrel industry in the western province. The head office of the new company is in Victoria, and Leo Sweeney of Victoria is the general manager.

The quietness in the wooden shipbuilding situation which has existed for the past six months was broken recently by an announcement by Inspector H. A. Barrett that the Dominion Government had decided to take over the shipyard at Victoria, B.C., and the uncompleted ships of the Victoria Ship Owners, Limited, and complete the programme.

The Forest Products Engineering Co. of Chicago are installing a piece-rate system based on "earned hours" in the plant of the Stratford Chair Co., Limited, Stratford, Ont. This is the second contract the Forest Products Co. have had with the above firm. The work is being supervised by Wm. Snaith, their Canadian representative.

The Ontario Government contemplates appointing a commission to make a special study of industrial and commercial conditions in Ontario, with a view to evolving plans which should tend to improve present conditions. This body will probably include representatives of the boards of trade, prominent manufacturers and a number of farmers.

We are reliably informed that on July 6th, 1921, the District Court in the Grand Rapids District entered judgment for 20,000.00 against the firm of the Hood-Wright Co. for infringement of the Perkins' patents. The appeal, which had been previously taken from the decision in this case, has been abandoned and the judgment paid by Mr. Hood and Mr. Wright.

The second annual picnic of the Wholesale Lumber Dealers' Association, Inc., Toronto, which was to have been held about the middle of July on the grounds of the Lake Shore Country Club near Clarkson, has been postponed until the latter end of August, owing to the excessively hot weather.

The Joseph Creighton Woodworking Co., London, Ont., are manufacturing a line of interior woodwork for both residential and store and office buildings. They also specialize in store fronts and the woodwork for store windows. At the present time they are enlarging and rearranging their plant in order to take

Put an end to all the worries of a speculative pay-roll

Have Your Exact Labor Costs at Your Finger Tips

What a nerve-racking, uncertain job it is to pour over those old-fashioned, unintelligible and sometimes "much altered" time sheets when pay day approaches!

What a feeling of doubt you must have to realize that after you have it all compiled ***according to the figures of those out-of-date hand-written time sheets*** you are then not sure that you have received the actual number of hours that you have purchased and are entitled to!

PUT AN END TO IT NOW!

Your exact purchases of labor can be tabulated accurately and quickly from the sheets or cards of the International Time Recorder or Internatioual Job Time Recorder. Those records once the employee has made them are unchangeable, printed and positive and in such form that they are readily computed.

Would you take away your yard foreman's lumber stick? Of course not. Then why not give the same degree of accuracy to your labor costs?

International Speed Accuracy Economy Business Machines

International Business Machines Co.

LIMITED

F. E. MUTTON, Vice-President and General Manager

Head Office and Factory: 300-350 Campbell Avenue, Toronto

HALIFAX, 44 Granville St. ST. JOHN, 18 Germain St. QUEBEC, 506 Merger Bldg. MONTREAL, 1 and 3 Notre Dame St. OTTAWA, 190 Queen St. TORONTO, 409½ Yonge St. HAMILTON, Room 8, 36 James St. S. LONDON, 489 Richmond St. WALKERVILLE, 44 Lincoln Rd WINNIPEG, 227 McDermott Ave. VANCOUVER, 110 Water St. SASKATOON, 254 Third Ave. S.

Also manufacturers of International Dayton Scales and International Electric Tabulators

care of the large volume of business offering. A few new machines are being added.

John T. O'Mara, with whom were associated several other Niagara Falls men, have purchased the Teal planing mill, Bridgeburg, and intend equipping it with the latest type of machinery. Six acres of land, adjacent to the mill, have been purchased. The new company, which has been formed, is planning to move a large stock of lumber to Bridgeburg, and will make portable buildings. The concern is capitalized at $40,000.

Fire recently destroyed the planing mill and lumber yard of Robert Stewart, Limited, Guelph. The blaze, which originated in the mill, was a fierce one, and in half an hour the structure was completely destroyed. Even the thick stone fire walls failed to stop the progress of the flames. Several other premises were destroyed before the blaze was subdued. The entire loss in the business district is estimated at half a million dollars, fortunately covered by insurance.

John Negrescon of Chicago, the inventor and patentee of the Klymax Washing Machine, was in Owen Sound recently on business connected with the Slade Mfg. Co., who make the Klymax in Canada. Mr Negrescon is president of the Home Utility Co., the American concern manufacturing the machine. Certain improvements have been made in the Canadian machine. The Slade Mfg. Co. is now well equipped to push the production of the machine.

The firm of Smith & Welch, lumber dealers, 2219 Yonge Street, Toronto, has been changed to Welsh Bros., W. R. Smith retiring owing to ill-health. Ivan Welsh has taken his brother, W. F. Welsh, who has been in the carpentering and contracting line for a number of years, into partnership, and the business is now being conducted under the style of Welsh Bros A planing mill is operated in connection with their yard.

A number of Stratford furniture manufacturers plan on leaving shortly for a business trip through Quebec and the Maritime Provinces. Those who contemplate taking this trip are H. W. Strudley, Imperial Rattan Co., Limited; L. J. Salter, McLagan Furniture Co., Limited; W. J. Anderson, Stratford Chair Co., Limited; F. W. Trebell, Kindle Bed Co., Limited; Chas. Farquharson, Farquharson-Gifford Co., Limited, and Chas. A. Moore of the Stratford Furniture Mfg. Co., Limited.

The Piano Cases & Phonographs, Limited, Brantford, Ont., have been specializing in the production of high-grade piano cases, K.D. and in the white. By specializing and adopting modern methods and equipment, they have been able to bring the manufacture of piano cases to a high state of perfection. Some of the manufacturers of pianos find it preferable to buy their cases ready for assembling and devote their entire attention to assembling, finishing and the other operations necessary to produce the completed product.

The employees of the Foster-Armstrong Piano Co., Kitchener, Ont., held a successful picnic recently at Waterloo Park. A number of interesting prizes were given in various sporting events. In recent months the firm has made rapid progress under the management of J. Ulman. Recently a shipment of pianos was made to New Zealand. The factory has been kept quite busy in spite of the quietness and general industrial conditions.

An application to wind up the business of the Mill Cut Homes & Lumber Co., Limited, Vancouver, B.C., was dismissed with costs recently by Justice Murphy of the B. C. court. The plant of this concern was destroyed by fire recently and the plaintiff desired to have the insurance money divided among the shareholders and the affairs of the company terminated. As the business was a legitimate one and the company was not bankrupt, his Lordship thought that the other shareholders were within their rights when they insisted that the business be carried on.

Robert Stewart, Limited, Guelph, Ont., whose planing mill and lumber yard was recently destroyed by fire, have completed arrangements for using part of the factory of the Bell Organ & Piano Co., probably the organ factory. The equipment of the plant of H. Cargill & Sons, Cargill, Ont., has been purchased and will be put in operation in the Bell plant as quickly as it can be moved and set up. The head office of Robert Stewart, Limited, will also bo located in the Bell building.

A meeting of the executive committee of the Furniture Manufacturers' Association was held recently in Toronto. Instead of holding this meeting in the board room of the association, as usual, they adjourned to the Royal Canadian Yacht Club, Centre Island, where they had lunch and spent the afternoon discussing the affairs of the association. Twelve members were in attendance. This new departure worked out very satisfactorily. Owing to the fact that they were away from the phone and other distractions, they were able to get down to business in quick order and devote their full attention to the matters in hand.

A provincial charter has been granted to the Long Lumber Co., Limited, of Hamilton, to carry on the business of lumber merchants, sawmill, shingle mill, planing mill and pulp mill owners, and to manufacture and deal in logs, lumber, timber, shingles, etc. Among the incorporators of the company are Guy Hathaway Long and Frank Robert Burton of Hamilton. The new company, which has been formed for the purpose of taking over as a going concern the business it has been successfully conducting for a number of years under the name of "The Long Lumber Co., Limited," has an authorized capital stock of $400,000, divided into 4,000 shares of $100.00 each.

The visiting furniture manufacturers, travellers and retailers, who attended the representative displays made at Kitchener, were recently entertained at the home of E. O. Weber. A splendid repast was provided. One of the features of the evening was a trial of strength between one horse and 35 men in a tug-of-war. In the first round human might prevailed, but in the second Dobbin took on a new lease of life and pulled his army of competitors all around the lot. There were two baseball matches. In the first fixture the travellers defeated the manufacturers by a score of three to one. Elated with their success, they undertook to trim a team of all-stars, and, much to their surprise, accomplished it. On the following night a supper and sports programme was held in Waterloo Park, Kitchener, which was followed by an enjoyable dance.

W. W. Wylie, one of the pioneer street car makers in Canada, died recently in Ottawa. For over twenty years he was general manager of the Ottawa Car Mfg. Co., and about eight years ago retired. He built the first sweeper ever used by the Ottawa Electric Railway, and was the first citizen in the Capital City to own an automobile. This was away back in 1894. Mr. Wylie was a practical and successful woodworker and builder

One Reason why Kraetzer Cured Gum is Straight and Flat.

Kraetzer-Cured Gum

THE ONLY KIND THAT IS ALWAYS BRIGHT, STRAIGHT AND FLAT

Kraetzer-Cured Gum does not "work" after being made up into furniture. It does not warp or open at the joints, or check in panels in the way that other less scientifically handled lumber does.

If you have used Kraetzer-Cured Gum, you know this already. If not, you owe it to yourself to find out about this super hardwood.

This "quality product" does not happen by chance. One reason is that Kraetzer-Cured Gum is steamed in the Kraetzer Preparator. Then every board is carefully graded, the sticking is scientifically and perfectly done, every stack is side ventilated, is elevated, and every pile is on wheels. Then, to begin with, remember that Kraetzer-Cured lumber is made from large virgin timber of exceptional quality.

Besides Gum, we have Oak, Ash, Tupelo, and Cypress of a quality that is unsurpassed.

Write us today for the reasons why Kraetzer-Cured lumber is *different* and *better*. We guarantee every board.

Our Protection

THE KRAETZER-CURED LUMBER CO.

Your Guarantee

The Kraetzer-Cured Lumber Co.

GENERAL OFFICE: GREENWOOD, MISS.

Band Mills: Greenwood, Miss., Moorhead, Miss.

The Sidman Lumber Curing Kiln

By following our simple instructions in using the above goods, the life of any kiln building can be extended almost indefinitely.

These fillers and finishes are also one of the reasons we can control BOTH the HEAT and HUMIDITY in a CONCRETE KILN BUILDING. We would like to tell you about our new Concrete Kiln.

The Sidmans of Canada

LONDON CANADA

and contributed to a large degree in bringing electrically-operated street car transit up to its present high state of efficiency. He was for some years in partnership with Richard Shore in Ottawa, and carried on an extensive carriage and waggon-building business before becoming associated with the Ottawa Car Co. The street cars turned out at this plant are known practically al over the Dominion, the firm being one of the biggest electric car manufacturing concerns on the continent.

LUMBER SITUATION GETTING SERIOUS.

J. N. Woolett, president of the Aberdeen Lumber Co., Chicago, Ill., recently returned from a three weeks' trip through Arkansas, Louisiana and Mississippi. The object of this trip was to gain first-hand knowledge of the situation which exists in the various lumbering centres. As a result Mr. Woolett wonders what the furniture manufacturers and other users of high-grade hardwoods are going to do for their stock for the coming year.

In outlining the impressions gained, he says a most casual glance at the various stock lists by the Southwestern lumber manufacturers discloses a startling scarcity of high-grade lumber. A personal trip through this territory strengthens the conviction that there is practically no firsts and seconds unsold on the market.

The stagnation of the past six months at the manufacturing end still continues, as practically all the mills have disbanded their organizations and are not operating. In my judgment there are two outstanding reasons why even after conditions improve there will be a marked absence in the resumption of manufacture: First, because the lumber cannot be put in pile at its present high cost of production and sold at a profit on the basis of to-day's price; second, a large number of the manufacturers are in bad shape financially, as their losses due to the spectacular drop in prices are very heavy, and the value of the low-grade lumber still in their yards is so low than even if shipped it would produce but little in real money, not sufficient to properly finance the production of new lumber. Practically every small mill producer is out of business, and only occasionally here and there is a mill actually manufacturing, and then only such logs as must be cut up to prevent their complete loss.

With considerably less than normal unsold stocks available and practically no firsts and seconds, it would appear to be an unusually fine time for the consumer to put in his yard such stock as he may need for fall manufacture, for undoubtedly many attractive bargains can now be secured, especially on No. 1 common grades.

For the producer of lumber we would welcome the return to the market of the consuming buyer at this time rather than to have them all wait until later in the year when the tendency would be for them to come into the market at the same time, thus causing an unhealthy condition. If there is a fair volume of business during the next ninety days, it would hold prices to a reasonable level and would justify the manufacturer where possible to resume his operation, thus keeping the available stocks at the mills in reasonable proportion to the demand which will appear during the next six or eight months.

No time like the present to mend that fastener in the half-broken belt.

Canadian Hardwoods

Good Stocks
Right Grades
Prompt Shipments

:: Members National Hardwood Lumber Association ::

Crating
of all descriptions

C. A. Spencer, Limited
Merchants and Manufacturers
McGILL BUILDING - MONTREAL

THE
GALL
LUMBER
CO.
Limited

Established 1875

HARDWOOD
LUMBER

MAHOGANY, WALNUT

Office, Yards and
Service Dry Kilns
Foot of Spadina Avenue
TORONTO, CANADA

We are carrying a large and well selected stock of

Dry Canadian Hardwoods

consisting of

4/4" & 6/4" Brown Ash
4/4" & 8/4" White Ash
4/4", 5/4" & 6/4" Basswood
4/4", 6/4", 8/4" & 12/4" Birch
4/4", 8/4" & 12/4" Hard Maple
4/4", 8/4" & 12/4" Oak
4/4", 8/4" & 12/4" Soft Elm

May we have the pleasure of quoting on your requirements?

Canadian General Lumber Company, Limited
712 Bank of Hamilton Bldg.
TORONTO
MONTREAL OFFICE: 203 McGill Bldg.

Selling
Graves, Bigwood & Co.'s
Lumber, Lath and Box Shooks

General Woodworking Trade Mart

Quick Action Section

Equipment Materials Employment

FOR SALE

Dowel and Skewer Machinery, also a couple of engines. Box 112, Canadian Woodworker, Toronto. 7-9

FOR SALE

1—9-track Morgan No. 9-30" Open Back Nailer and Cleater.
2—9-track Doig No. 4 Closed Back Nailers and Cleaters.
1—6-track Grammes Cigar Box Nailer.
2—4-track Morgan No. 4 Plain Nailing Machines.
1—8-track Morgan No. 8 Plain Nailing Machine.
1—12-track Morgan No. 12 Plain Nailing Machine.
1—19 x 44" Connell & Dengler 2-col. Box Printer.
2—Fischer Box-Board Matchers.
1—Doig 2-head Corrugated Fastener Driver.
1—Woods No. 190 Power Feed Railway Cut-off Saw.
6—Hall & Brown Roller Carriage Cut-off Saws.
1—Chase-Turbine No. 245 Bottle Box Groover.
1—54" Berlin No. 284 Vertical Band Resaw.
1—Berlin No. 229 Double Cut-off Saw.
1—Hoosier Self-feed Rip Saw.

Box Machinery, Veneer Machinery, Woodworking Machinery of all kinds. Send us your inquiries.

Chas. N. Braun Machinery Co., Fort Wayne, Ind., U.S.A. 7-8

Woodworking Plant
For Sale or To Rent

Manufacturers in good lake town, north of Toronto, making products of wood and iron, are discontinuing the wood lines and their woodworking shop with all or part of the machinery and equipment is for sale at a low rate on the dollar, or for rent at a low rental for a year or two, with option of purchase. Building is a separate unit, modern concrete mill construction, 60 ft. x 100 ft., two stories, complete with machinery, 200 h.p. steam plant, belting, shafting, shaving exhaust system, dry kilns, elevators, plumbing, electric wiring, two railway sidings, large yard, etc., ready to step into for immediate operation. Hydro-Electric power will be available shortly. Box 111, Canadian Woodworker, Toronto, Ont. 7

Position wanted

Young married man, steady, eight years' experience in lumber business as bookkeeper and stenographer, wishes change to woodworking industry, Ontario preferred. Best of references; salary $125 00. Apply Box 110, Canadian Woodworker, Toronto.

GOOD VALUES

Subject to Prior Sale

These are only a few of our stock

Moulder, Hermance, 8 and 10", 4 side.
Moulder, Woods, 10 and 12" inside.
Moulder, American, 10", 4 side.
Sander, endless bed, 48", H. B. Smith.
Belt Sander, Curtis No. 20.
Sander, Moore Machine Co., belt.
Matcher, American No. 229, fast feed hardwood flooring.
Band Resaw, Connel & Dengler, 60".
Band Resaw, Mershon, 44".
Band Rip Saw, American No. 1.
Circular Saw Mill, Hossier Pony.
Circular Resaw, 44", heavy type.
Jointer, Falls Machine Co., undercut 24", power feed.
Puzz Planer, 16 and 24".
Lathe, Back Knife Clement, 40".
Planer, 30", Fay & Egan Single Cabinet.
Dowell Machines, Hayes and Fay.
Dowell Gluer and Driver, E. B. Hayes.
Door Clamp, Hayes Standard Power.

Woodworking Machinery Company of Buffalo,
54 Mechanic St.,
Buffalo, N.Y.

FOR SALE

New Time Recorder, numbered to 100; never been used. Apply Box 113, Canadian Woodworker, Toronto. 7-9

FOR SALE

Dovetail Box Machinery (St. Paul), complete set, good condition, cheap. J. L. Neilson & Co., Winnipeg. 8

Saskatchewan Carbonizing Coal Ovens

In 1914 the Saskatchewan Government published a report upon certain experiments in the carbonizing and briquetting of lignite coal, which they caused to be undertaken in the Estevan district. These experiments were in charge of Mr. S. M. Darling, and a very comprehensive report was published at the conclusion of the experiments.

Applications for copies of this report have been received by the government from distant parts of the world, even from Japan, and acknowledgement of the reports indicate a lively interest in the particular method of carbonizing followed by the government of Saskatchewan in these experiments.

It is reported that a company in Arizona has put into operation one of the Saskatchewan types of graduated carbonizing ovens, and that the oven worked splendidly, and so impressed were the officers and directors of the company who had examined the workings, that at the conclusion of their examination they gave instructions to quadruple the plant.

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Is Lumber Good Buy at Present Time?

Report of Personal Investigation by W. B. Granger — Indications Point to Shartage of Certain Stocks — Buying Appears to be Slowly Increasing

The Editor of "Associated Furniture," a paper published in the interests of the various American furuiture manufacturers' associations, recently completed a thorough investigation of the lumber situation. A few paragraphs from his report are reproduced here. It must be understood that this investigation was carried out from the viewpoint of, and in the interests of, the furniture manufacturer; therefore, it should not be considered to contain just what the lumbermen would like to have published. The demand for lumber has shown a slight improvement and the prices of a few items which are becoming scarce have advanced from $5 to $10 per thousand. This is an indication that a shortage is developing in certain lines, rather than a sign that buying is becoming general. Were the latter to be true, prices would jump almost immediately. The suggestion that the opportune time to buy is now is a good one.—The Editor.

At the outset of this article the author desires to call particular attention to the fact that the information contained is the result of a personal interview with the executive heads of practically all of the largest lumber manufacturers in the Memphis, Louisville and Chicago markets, and while there may be some furniture manufacturers who may accuse me of letting the "enemy" fill me full of "hot air," I believe the general firming up of quotations during the past three weeks should convince even the most skeptical that the data here given represents facts—not fiction.

Perhaps one of the things that has contributed to the false impressions that exists with regard to the actual lumber situation has been the fact that so many lumber manufacturers themselves flooded the market with stock sheets in their efforts to secure even a little business at a time when business was hard to get but the fact remains that regardless of these deluges of stock sheets, there is not at the present time anywhere near a normal stock of the grades and thicknesses of oak and gum (in particular) on hand, and furthermore, with conditions in the lumber industry as they are today, there will be no new stocks of any consequence available prior to January 1st, 1922.

In the first place it is a recognized fact that 60 per cent. of the hardwood lumber produced is manufactured by approximately twelve hundred commercial sawmills, while the other 40 per cent. comes from little plantation owners, and other small manufacturers, who number about five thousand. It is these latter producers who under normal conditions manufacture the surplus of lumber which really governs the market.

These small producers have done no logging since October of 1919, and their stocks have long since been absorbed and are out of the market. The reason for this has been that the winter of 1919-1920 was one of the worst that lumber manufacturers have experienced in a long time and logging operations were absolutely impossible, except for a few manufacturers who are in a position to cut timber under almost any conditions.

It is, of course, true that the production of these small operators does not ordinarily reach the furniture manufacturer for the reason that their stocks run so unevenly that they will not cut to advantage in our factories. There are, however, many places where they can be used and the elimination of the production of these stocks is therefore a serious matter, because it will bring many buyers, who ordinarily do not purchase from large operators, into the market at sources that supply our requirements.

A thorough investigation of operating conditions in the lumber industry to-day would place present production at less than 15 per cent. of normal. In fact, the author has found only three concerns who are logging at the present time. Quite a few manufacturers had fair supplies of logs on hand at the time logging operations were stopped, but with few exceptions these concerns have already cut up what stocks they had on hand and have now closed their plants down tight and are simply taking the position that they will not even consider resuming operations until the market gets back to a point of where they can sell their products at a price that will enable them to make a profit.

In the south there has been 25 inches of rain during the last six weeks, and this means that even if the operators so desired, it would be impossible for them to get into the timber short of July 1st. When it is further considered that the forces of these operators have been disorganized and that it would take from sixty to ninety days to put their organizations back into any kind of shape, it would be conceded that logging operations cannot be looked for before the middle of July at the very earliest.

The fact of the matter is that it will be very surprising if logging operations are under way prior to September 1st, but even though they were, it must be conceded that there would not be any dry stock suitable for furniture manufacture available for at least four months after the logs are put on sticks

One of the biggest factors affecting the situation at the present time is the fact that owing to the extremely high price on lumber and the strong demand in the early part of 1920 the operators had begun to pick up very low grade logs and the percentage of F A S and No. 1 common produced during the past year was therefore far below normal.

The fact of the matter is that a canvas of the stocks on hand at mill points among Memphis operators shows stocks of F A S oak and gum running only 8 per cent. of total footage on hand whereas, under normal conditions they should run from 16 to 18 per cent.

Were it not for the fact that the flooring mills had picked up so much inch common oak the situation on that item would not be quite so serious, but when it is realized that a normal stock is only about 25 million feet, it can be readily seen why prices have already advanced from $7.00 to $10.00 per thousand.

On red gum, the same situation prevails on F A S; in fact, the author saw one operator call up 14 different concerns in an effort to find a car of 4/4 plain, without success.

Sap gum doesn't seem to be so bad, except F A S stocks are considerably below normal, but taking all items as a whole the conclusion can only be reached that with each succeeding sale the price of lumber will firm up a little more.

Many operators are to-day quoting as high as $50 for common oak at the mill. If you don't want to pay that amount, the time to cover is now.

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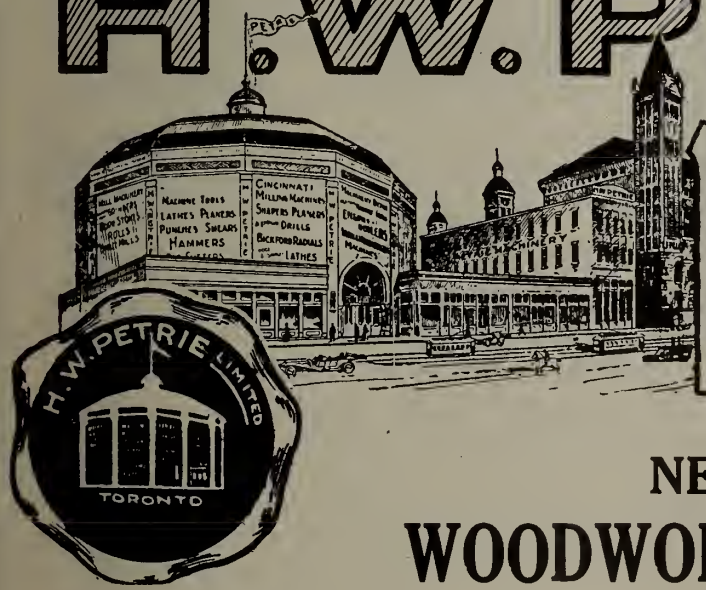

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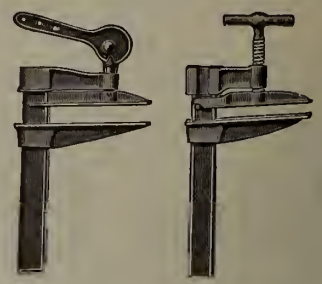

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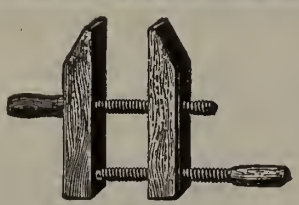

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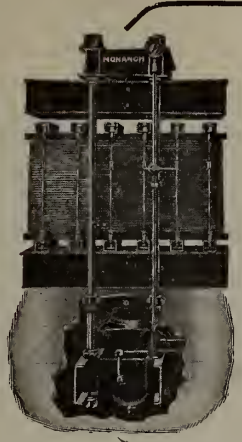

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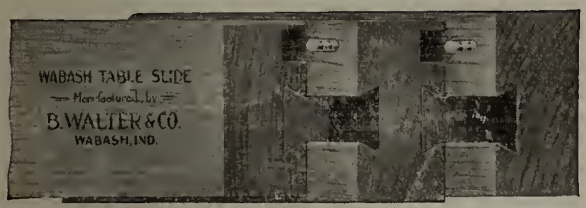

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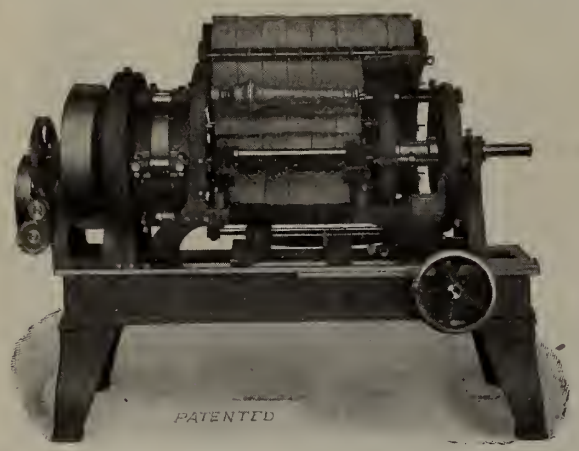

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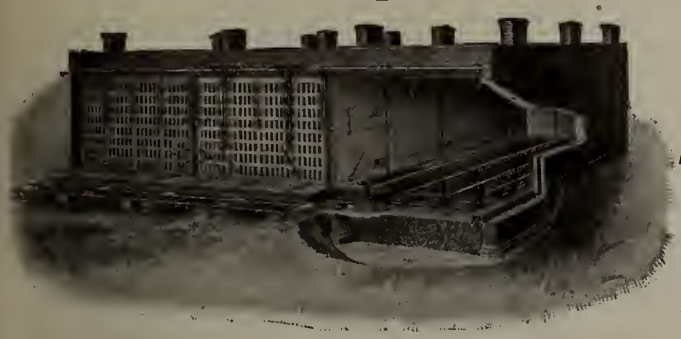

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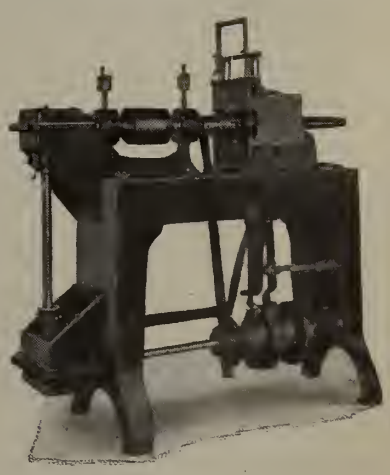

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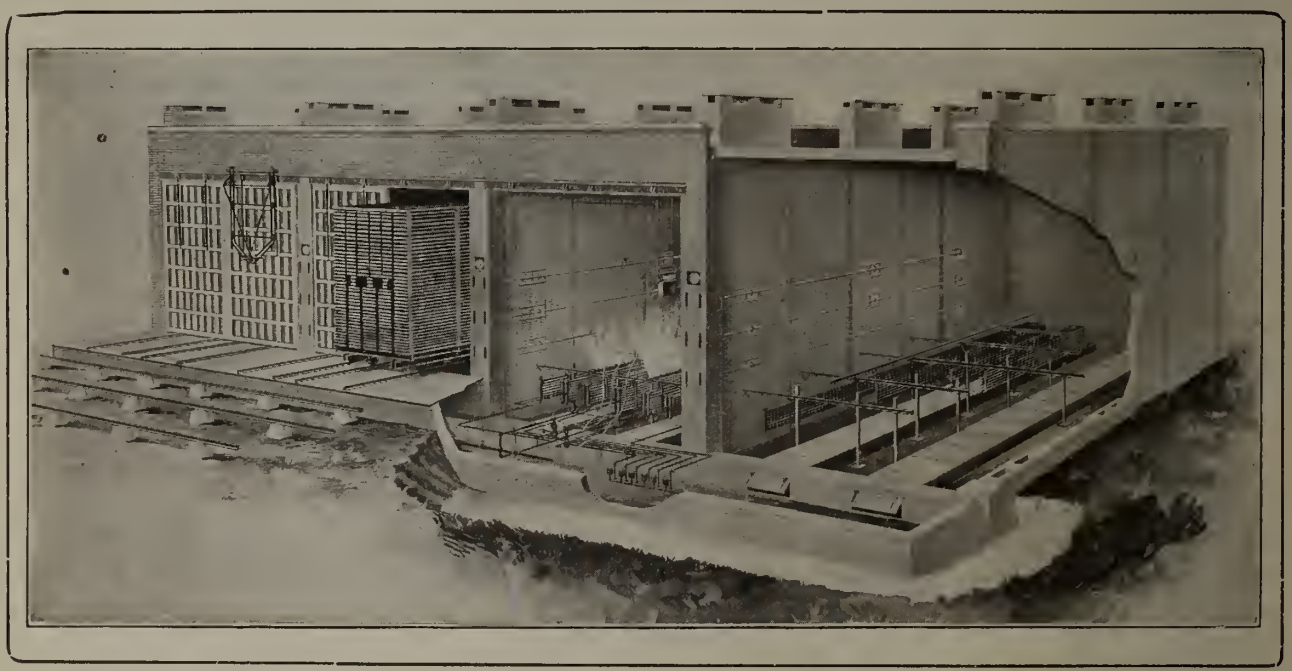

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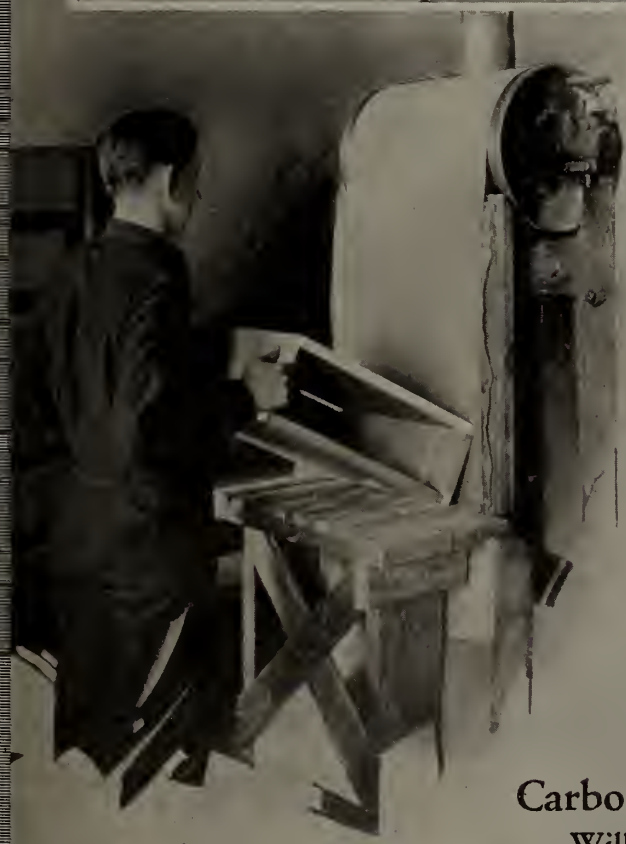

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Cary Mfg. Company, Brooklyn, N.Y.

CRATING LUMBER
Lloyd, W. Y., Toronto, Ont.
Colborn, C. B., Memphis, Tenn.

CROSS-CUT, MITRE AND RIP SAWING MACHINE
Mackenzie Machinery Co., D., Guelph, Ont.

CUT-OFF SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

CUSHIONS
Cumfy Cushion Co., Toronto, Ont.

CUTTER HEADS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Mattison Machine Works, Rockford, Ill.
Shimer Cutter Head Co., Galt, Ont.
Yates Machine Co., P. B. Hamilton, Ont.

CYLINDER HEADS
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.

DOOR CARRIERS FOR DRY KILNS
Dry Kiln Door Carrier Co., Indianapolis, Ind.

DOVETAILING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

DOWEL MACHINES
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.

DOWELS
Canada Wood Specialty Co., Ltd., Orillia, Ont.
Rowe Mfg. Co., Newaygo, Mich.

DRY KILNS
Canadian Blower & Forge Co., Kitchener, Ont
Curtis-Hosey Dryer Co., Montreal, Que.
Grand Rapids Veneer Works, Grand Rapids Mich.
National Dry Kiln Co., Indianapolis, Ind.
Sidmans, London, Ont.
Standard Dry Kiln Co., Indianapolis, Ind.

DUST COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

DUST SEPARATORS
Canadian Blower & Forge Co., Kitchener, Ont.

EDGERS (Single Saw)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Radcliff Saw Mfg. Co., Toronto, Ont.

EDGERS (Gang)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

EDGER SAWS
Atkins & Co., E. C., Hamilton, Ont.

ELECTRIC SUPPLIES
Northern Electric Co., Montreal, Que.

ENAMELS
Celluloid Zapon Co., New York.

END MATCHING MACHINES
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont
Yates Machine Co., P. B., Hamilton, Ont.

EXHAUST FANS
Canadian Blower & Forge Co., Kitchener, Ont.
Garlock-Walker Machinery Co., Toronto, Ont

EXHAUST SYSTEMS
Canadian Blower & Forge Co.
Neville-Cooper Co., Toronto.

FIBRE CORD
Grand Rapids Fibre Cord Co., Grand Rapids.

FEED ROLLS
Atkins & Co., E. C., Hamilton, Ont.

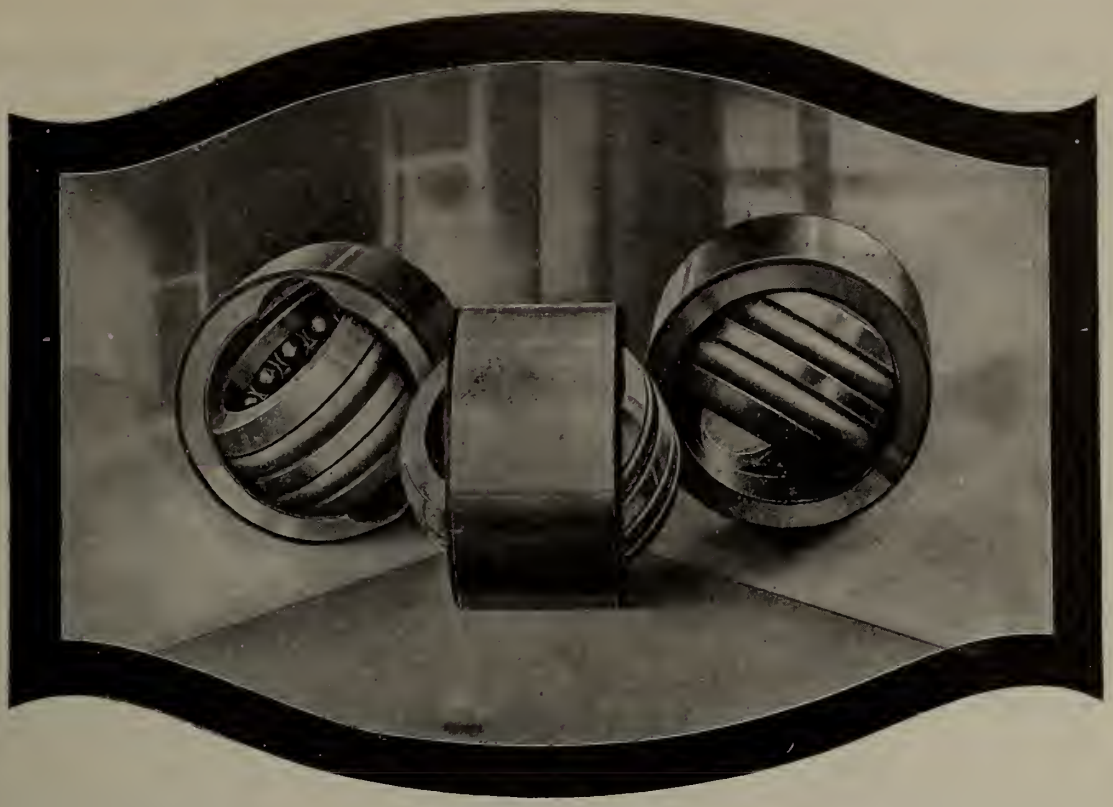
FINISHING PRODUCTS
Campbell Co., M. L., Kansas City, Mo.

FLOORING MACHINES
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

FURNITURE LEATHER
Eagle-Ottawa Leather Co., Grand Haven, Mich
Mechanical Leathers, Ltd., Toronto.

FURNITURE TRIMMINGS
Foster, Merriam Co., Meriden, Conn.

GARNET PAPER AND CLOTH
Carborundum Co., Niagara Falls, N.Y.
Macdonald, Norman, Toronto, Ont.
Oakey & Sons, Limited, John, London, S.E.I. (Wellington Emery & Black Lead Mills).



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—Difficulty in adjusting machines

—Slow speed due to limitations of bearings or slipping of belts

—Belt trouble at high speed.

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TORONTO - - MONTREAL

SKF

"Canadian Woodworker" Buyers' Directory—Continued

GRAINING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GLUE
Casein Mfg. Company, New York, N.Y.
Casein Glue Mfg. Co., Chicago, Ill.
Perkins Glue Company, South Bend, Ind.
Sampson & White, London, England.

GLUE CLAMPS
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane, & Company, Kitchener
Taylor Mfg. Co., Jas. L., Poughkeepsie, N.Y.

GLUE HEATERS
Fay & Egan Co., J. A., Cincinnati, Ohio.
International Electric Co., Indianapolis, Ind.
Jackson, Cochrane, & Company, Kitchener
Oliver Machinery Co., Grand Rapids, Mich.
Pringle, R. E. T., Toronto, Ont.

GLUE JOINTERS
Casey Co., M. E., Montreal, Que.
Jackson, Cochrane & Company, Kitchener, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GLUE SPREADERS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener.

GLUE ROOM EQUIPMENT
Perrin & Company, W. R., Toronto, Ont.

GRINDERS (Cutter)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

GRINDERS (Knife)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDERS (Tool)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GROOVERS
Atkins & Co., E. C., Hamilton, Ont.

GROOVING HEADS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Mattison Machine Works, Rockford, Ill.

GUM LUMBER
Aberdeen Lumber Co., Pittsburg, Pa.
American Hardwood Lumber Co., St. Louis, Mo.
Anderson-Tully Co., Memphis, Tenn.
Barr-Holaday Lumber Co., Greenfield, Ohio.
Brown & Co., George C., Memphis, Tenn.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Colborn, C. B., Memphis, Tenn.
Darnell-Love Lumber Co., Leland, Miss.
Gum Lumber Association, Memphis, Tenn.
Hyde Lumber Company, South Bend, Ind.
Merceau-Hawkins Tie Co., Huntington, W.Va.
Paepcke-Leicht Lumber Co., Chicago, Ill.
Sondheimer Co., E., Memphis, Tenn.

HAND SCREWS
Fay & Egan Co., J. A., Cincinnati, Ohio.

HANDLE & SPOKE MACHINERY
Fay & Egan Co., J. A., Cincinnati, Ohio.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Whitney & Son, Baxter D., Winchendon, Mass

HARDWARE
Laidlaw Bale-Tie Co., Hamilton, Ont.
Weber-Knapp Co., Jamestown, N.Y.

HARDWOOD DIMENSION STOCKS
Brown Bros. & Co., New York.
Colborn, C. B., Memphis, Tenn.

HARDWOOD LUMBER
American Column & Lumber Co., Columbus, Ohio.
American Hardwood Lumber Co., St. Louis, Mo.
American Oak Mfrs.' Assn., Memphis, Tenn.
American Walnut Association, Washington, D.C.
Anderson-Miller Co., Toronto, Ont.
Anderson, Shreiner & Mawson, Toronto, Ont.
Anderson-Tully Co., Memphis, Tenn.
Arkla Lumber & Mfg. Co., St. Thomas.
Arrow Lumber Co., Parkersburg, W. Virginia
Atlantic Lumber Company, Toronto, Ont.
Bacon Lumber Co., Cleveland, Ohio.
Banning, Leland G., Cincinnati, Ohio.
Barr- Holaday Lumber Co., Greenfield, Ohio.
Barlett Lumber Co., W. C., Charleston, Va.
Bedna Young Lumber Co., Jackson, Tenn.
Biglow-Cooper Co., Bay City, Mich.
Bonner & Sons, J. H., Memphis, Tenn.
Brown Bros. Co., New York.
Brown & Company, Geo. C.
Bruce Co., E. L., Little Rock, Ark.
Burns & Knapp Lbr. Co., Conneautville, Ohio.
Bury & Company, Robert, Toronto, Ont.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Colborn, C. B., Memphis, Tenn.
Conkling Lumber Co., Frank A., Memphis, Tenn.
Canadian General Lumber Co., Toronto, Ont.
Chicago Mill and Lumber Co., Chicago, Ill.
Clark & Sons, Edward, Toronto.
Dacus-Richards Hardwood Co., Memphis, Tenn.
Darnell-Love Lumber Co., Leland, Miss.
DeHewit Lumber Co., Huntington, Va.
Dooley Lumber Co., F. T., Memphis, Tenn.
Evansville Band Mill Co., Evansville, Ind.
Frye Lumber & Veneer Co., J. W., Dayton, O.
Gayoso Lumber Co., Memphis, Tenn.
Hall Lumber Co., Thos., Charleston, W.Va.
Heeney, Percy E., Kitchener, Ont.
Hyde Lumber Co., South Bend, Ind.
Kosse, Shoe & Schleyer Co., Cincinnati, O.
Kraetzer-Cured Lumber Co., Greenwood, Miss.
Leach & Co., J. D., Chicago, Ill.
Liverpool Hardwood Co., New York.
London Lumber Co., London, Ont.
Long-Knight Mfg. Co., Indianapolis, Ind.
Luehrman Hardwood Lbr. Co., St. Louis, Mo.
May Bros., Memphis, Tenn.
McLean Mahogany & Cedar Co., Buffalo, N.Y.
McLennan Lumber Co., Montreal, Que.
Memphis Band Mill Co., Memphis, Tenn.
Mengel Co., Louisville, Ky.
Merceau-Hawkins Tie Co., Huntington, W.Va.
Mowbray & Robinson, Cincinnati, Ohio.
Murrelle Lumber Company, Memphis, Tenn.
Nicholson & Co., E. M., Montreal, Que.
Nichols & Cox Lumber Co., Grand Rapids, Mich.
Otis Mfg. Co., New Orleans, La.
Paepcke Leicht Lumber Co., Chicago, Ill.
Payson, Smith Lumber Co., Minneapolis, Minn.
Pedwell Hardwnod Lumber Co., Toronto, Ont.
Perkins Bros., Kelso, Ark.
Peytona Lumber Co., Huntington, W. Va.
Pickrel Walnut Co., St. Louis, Mo.
Powe Lumber Co., Thos. E., St. Louis, Mo
Rush Lumber Co., Memphis, Tenn.
Sawyer Goodman Co., Marinette, Wis.
Sondheimer Co., E., Memphis, Tenn.
Spencer, C. A., Montreal, Que.
Spotswood & Son, E. R., Lexington, Ky.
Stark & Co., Jas. E., Memphis, Tenn.
Stimson Hardwood Co., J. V., Memphis, Tenn.
Stimson & Co., J. V., Owensboro, Ky.
Tallahatchie Lumber Co., Memphis, Tenn.
Tennessee Lumber & Coal Co., Cincinnati Ohio.
Thompson, Katz Lumber Co., Memphis, Tenn.
Thompson & Co., Lewis, Philadelphia, Pa.
Upham & Walsh, Chicago, Ill.
Vail Cooperage Co., Fort Wayne, Ind.
Warren-Ross Lumber Co., Jamestown, N.Y.
Whiting Co., Wm. S., Johnson City, Tenn.
Wisconsin Lumber Co., Chicago, Ill.
Wayne Lumber Co., New York
Wood Mosaic Co., Louisville, Ky.
Yellow Poplar Lumber Co., Coal Grove, Ohio.

HYDRAULIC VENEER PRESSES
Perrin & Company, Wm. R., Toronto, Ont.

INSURANCE
Lee Blakemore, Inc., Toronto, Ont.

KNOBS
Waddell Mfg. Co., Grand Rapids, Mich.
Rowe Mfg. Co., Newaygo, Mich.

JOINTERS
Canada Machinery Corporation, Galt, Ont.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

KNIVES (Planer and others)
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

LATHES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochane & Company. Kitchener. Ont.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie. H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

LEATHER (Artificial)
Fibro Mfg. Company, Beverly, N. J.
Mechanical Leathers, Ltd., Toronto.

LEATHER CLOTH
Zapon Leather Cloth Co., New York.

LUMBER MEASURER
Durant Mfg. Co. Milwaukee, Wis.

MACHINE KNIVES
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Peter Hay Knife Company, Galt, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont

MIRRORS
Chicago Mirror & Art Glass Co., Chicago, Ill.

MITRE SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.

MOTOR TRUCK EXTENSIONS
Swedish Crucible Steel Co., Windsor, Ont.

MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A. Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

NAILS
Laidlaw Bale-Tie Co., Hamilton, Ont.

NAILING MACHINES
Morgan Machine Co., Rochester, N.Y.

OIL
Zero Oil Co., Parkersburg, Pa.

OIL STONE GRINDERS
Mummert-Dixon Co., Hanover, Pa.
Oliver Machinery Co., Grand Rapids, Mich.

PANELS
Algoma Panel Co., Algoma, Wis.
Gorham Bros., Mount Pleasant, Mich.
Hardwood Products Co., Nennah, Wis.
Hay & Co., Woodstock, Ont.
Roberts, Geo. G., Chicago, Ill.
Waetjin & Co., L., Milwaukee, Wis.

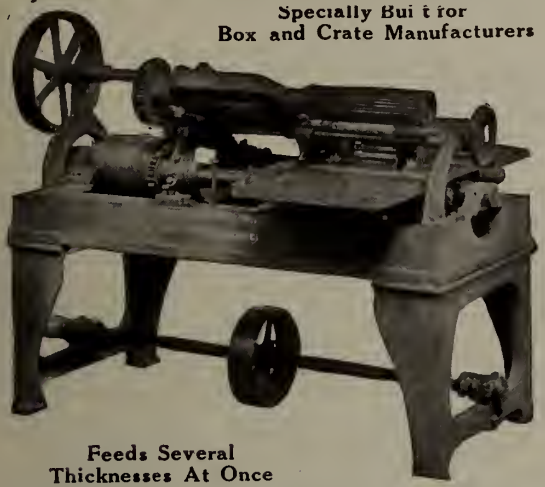
PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PERIOD MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich

PERIOD TURNINGS
Decorators Supply Co., Chicago, Ill.

"The Chattanooga" — Just Another Name For Fast, Economical Gang Ripsawing

Specially Built for Box and Crate Manufacturers



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Has powerful feed and securely holds down and feeds short pieces. The feed rolls are automatically adjustable to varying thicknesses. Upper rolls are driven by cut gears, and the lower ones by sprocket chain. Several thicknesses of veneering can be fed thru machine at one time.

The CHATTANOOGA is an unusually big producer, easily operated, and turns to profitable account short stuff lying around a mill—otherwise wasted.

Attractive price. Complete information on request

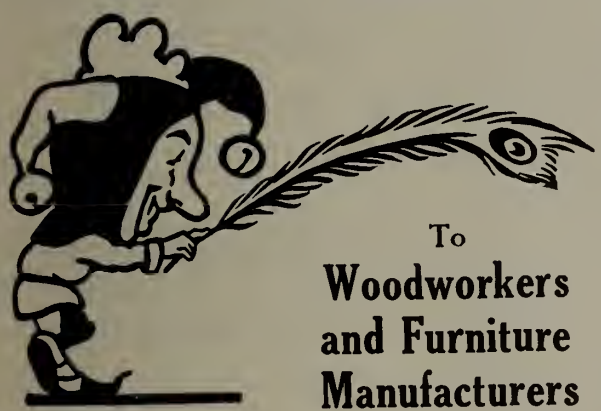
Chattanooga Machinery Company
Chattanooga, Tenn.

We Manufacture a complete line of

Chair, Cane-Cutting and Bending Machines

CUTS AND CATALOG UPON REQUEST

L. G. McKnight & Son Co.
GARDNER, MASS.



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Your requirements in Reed Forms for Wicker Work Furniture, Mechanic's Tool Cases, Dowels, Novelties, Cedar Chests, Piano Lamps, Table Lamps, etc., can be promptly supplied by us.

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BRANTFORD

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And in order to clear our present stock we are prepared to accept any reasonable offer on the following machines. Write for full description, or call and inspect same.

1 Automatic Knob Machine, with quantity of cutters
1 Jig Saw, Goldie & McCulloch
1 Jig Saw, McGregor-Gourlay, wood top
1 American Double Disc, 36" Sander, adjustable tables
2 American Three-screw Veneer Presses, 38" wide
1 Gravity Swing Cut-off Saw, McGregor-Gourlay
1 12" Moulder, Cowan & Co., 4-sided
1 16" Buzz Planer, Clark-Demill
1 No. 5 Buffalo Blower
1 No. 3 Sturtevant Blower
1 Band Saw, 34", McGregor-Gourlay
1 High Speed Ball-bearing Shaper, Preston
1 Tennant Machine, McGregor-Gourlay
1 3-sided 7" Cowan & Co. Moulder
1 Chaser Grinder, Modern Tool Co.
1 Double Exhauster, 45", American Blower Company
1 C. M. C. No. 212 Double Surfacer Planer, 30"
1 Sash Sticker, H. W. Petrie
1 Dowelling Machine, M31, Cowan No. 2, cap. up to 2½"
1 S. A. Woods Matcher and Planer, 15" x 6"

General Machinery Company
67-69 Frederick St., Toronto
TELEPHONE MAIN 2200

"Canadian Woodworker" Buyers' Directory—Continued

PLANERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co.. P. B., Hamilton, Ont.

PLANING MILL MACHINERY
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Mattison Machine Works, Rockford, Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PRESSES (Veneer)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Jackson, Cochrane & Company, Kitchener, Ont.
Perrin & Co., Wm. R., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

REED
Carter & Co., E. T., Toronto, Ont.
Overseas Reed and Cane Co., Ionia, Mich.

REED MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

RESAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

RIM AND FELLOE MACHINERY
Defiance Machine Works, Defiance, Ohio.
Fay & Egan Co., J. A. Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mackenzie Machinery Co., D., Guelph, Ont.
Mattison Machine Works, Rockford, Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

ROSETTES
Waddell Mfg. Co., Grand Rapids, Mich.

RUBBING MACHINES
DeVilbiss Mfg. Co., Toledo, Ohio.
Mattison Machine Works, Rockford, Ill.

SAFETY DEVICES
Cowan & Company, Galt, Ont.

SANDERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SASH, DOOR & BLIND MACHINERY
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R,, Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SAWS
Atkins & Co., E. C., Hamilton, Ont.
Disston & Sons, Henry, Toronto, Ont.
Radcliff Saw Mfg. Company, Toronto, Ont.
Seibert & Co., Louis, Cincinnati, Ohio.
Shurly-Dietrich, Ltd., Galt, Ont
Simonds Canada Saw Co., Montreal, Que.

SAW SHARPENERS
Hooker & Son. O. V., St. Johnsbury, Vt.
Oliver Machinery Co., Grand Rapids, Mich.

SAW SWAGES
Atkins & Co., E. C., Hamilton, Ont.
Cowan & Company, Galt, Ont.
Crowel, D. J., Buffalo, N. Y.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co.. J. A. Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mtg. Co., Toronto, Ont.

SAW TABLES
Canada Machinery Corporation, Galt, Ont. ..
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SCRAPING MACHINES
Canada Machinery Corporation, Galt, Ont. ..
Garlock-Walker Machinery Co., Toronto, Ont.
Whitney & Sons, Baxter D., Winchendon, Mass.

SCREW DRIVING MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.
Reynolds Machine Co., Massillon Ohio.

SCROLL SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont. ..
Casey Co., M. E., Montreal, Que.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Jackson, Cochrane, & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamiltonfi Ont.

SECOND-HAND MACHINERY
Casey, M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Osborne Sexton Machinery Co., Columbus, O.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Woodworking Machinery Co. of Buffalo, Buffalo, N.Y.

SHAPERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Sons, Baxter D., Winchendon, Mass
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SHAVING COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

STAINS
Ault & Wiborg, Toronto, Ont.
Williams Bros. & Co., Hounslow, Eng.

SINGLE SPINDLE BOXING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati. Ohio.

STAVE SAWS
Atkins & Co., E. C., Hamilton, Ont.

STAVE SAWING MACHINE
Whitney & Son, Baxter D., Winchendon. Mass

STEEL DOOR MATS
Cary Mfg. Company, Brooklyn, N.Y.

SURFACERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Yates Machine Co., P. B., Hamilton, Ont.

SWING SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Eaglesfield, R. D., Indianapolis, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE LEG LATHES
Fay & Egan Co., J. A., Cincinnati, Ohoa.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE SLIDES
Jefferson Woodworking Co., Louisville, Ky.
Walter & Company, B., Wabash, Ind.

TEMPERATURE REGULATORS
Canadian Powers Regulator Co., Toronto, Ont.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Compan, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TIME CLOCKS
International Business Machines Co., Toronto, Ont.

TOPS
Gorham Bros., Mount Pleasant, Mich.

TRIMMERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co.. Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Pretson, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TRUCKS
Cowan Truck Company, Toronto, Ont.
National Dry Kiln Co., Indianapolis. Ind
Oliver Machinery Co., Grand Rapids, Mich.

TURNED WOOD GOODS
Algoma Wood Products Co., Algoma, Wis.
Canada Wood Specialty Co., Orillia, Ont.
Rowe Mfg. Co., Newaygo, Mich.

TWINES & WEBBING
Doon Twines, Ltd., Kitchener, Ont.

MORGAN
NAILING MACHINES

Are built strongly for heavy continuous service. Machines adapted to all kinds of special nailing.

Regular machines for all sizes of boxes and crates.

Write us for descriptive literature.

Machines that save money

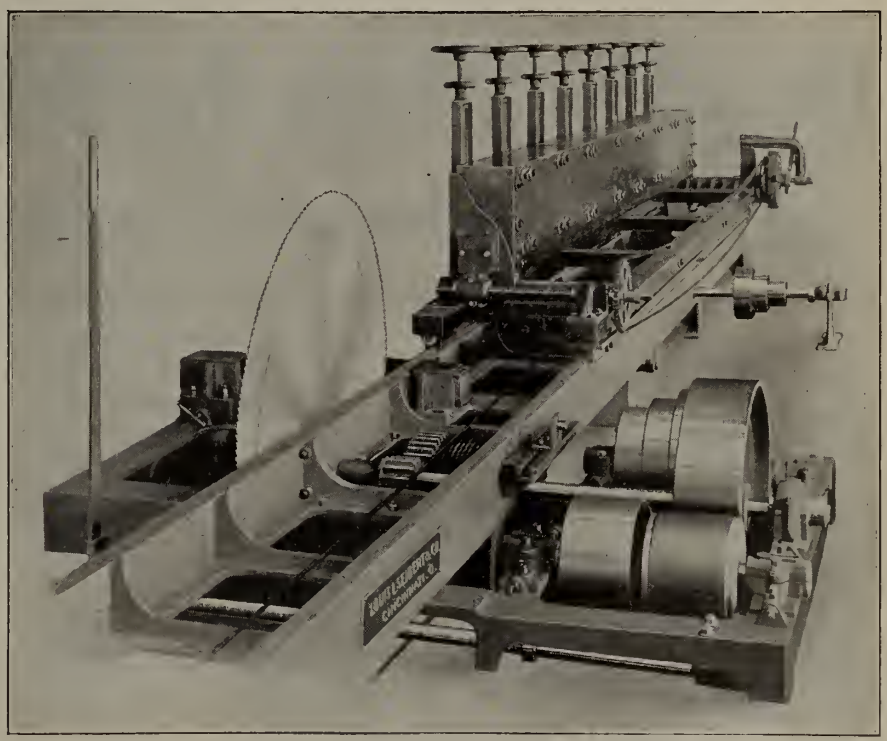
Morgan Machine Co.

DEPT. A ROCHESTER, N.Y.

Morgan No. 12-30 Open Back Nailing Machine, Fitted with motor.

Veneer
and
Thin Lumber Saws

POSITIVE AUTOMATIC SET WORKS
AND
OFFSET



"A Mill Backed by Thirty Years' Progressive Experience."

Louis L. Seibert & Company, CINCINNATI, OHIO

"Canadian Woodworker" Buyers' Directory—Continued

VARNISHES
Adams & Elting Co., Chicago and Toronto.
Ault & Wiborg Company, Toronto. Ont.
Penfound Varnish Co., Toronto, Ont.

VARNISH DRYERS
Nicholls Co., A. S., New York, N.Y.

VARNISH SPRAYERS
DeVilbiss Mfg. Co., Toledo, Ohio.
Paasche Air Brush Company, Chicago, Ill.

VENEERS
Batesville Lumber & Veneer Co., Lawrenceburg, Ind.
Birds Eye Veneer Co., Escanaba, Mich.
Bury & Compny, Robert, Toronto, Ont.
Central Lumber Co., Indianapolis, Ind.
Christmann Veneer & Lumber Co., St. Louis, Mo.
Curtis Co., C. E., Chicago
Dean Spicker Company, Chicago, Ill.
Empire Veneer Company, Chicago, Ill.
Evansville Veneer Co., Evansville, Ind.
Freiberg Lumber Co., Cincinnati, Ohio
Frye Lumber & Veneer Co., J. W., Dayton, O.
Hartzell, Geo. W., Piqua, Ohio.
Hoffman Bros. Company, Fort Wayne, Ind.
Holden, Henry S., Chicago, Ill.
Hardwood Prudocts Co., Neenah, Wis.
Korn-Conkling Co., Memphis, Tenn.
Long-Knight Lumber Co., Indianapolis, Ind.
Litton Veneer Co., Rockford, Ill.
Memphis Veneer & Lumber Co., Memphis, Tenn.
Mowhawk Veneer Co., Warren, Pa.
Munising Woodenware Co., Munising, Mich.
National Veneer & Lumber Co., Indianapolis, Ind.
North Vernon Lumber Co., North Vernon, Ind.
Northwestern Cooperage & Lumber Co., Gladstone, Mich.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod-Jurden Co., Memphis, Tenn.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Veneer Co., New Albany, Ind.
Roberts, Geo. G., Chicago, Ill.
Southern Veneer Mfg. Co., Louisville, Ky.
Stimson Veneer & Lumber Co., Memphis, Tenn.
Talge Mahogany Co., Indianapolis, Ind.
Thompson & Co., Lewis, Philadelphia, Pa.
Toronto Veneer Company, Toronto, Ont.
Veneer Manufacturers Co., Chicago, Ill.
Waetjen & Co., George L., Milwaukee, Wis.
The Williamson Veneer Company, Mills—Baltimore, Md. Sales Branches, New York, N. Y., Chicago, Ill., Jamestown, N.Y., High Point, N.C.
Warren Ross Lumber Co., Jamestown, N. Y.
Wood Mosaic Co., Louisville, Ky.

VENEER SAWS
Atkins & Co., E. C., Hamilton, Ont.

VENEER TAPE
Canadian Nashua Paper Co., Peterboro, Ont.
Gummed Products Co., Troy, Ohio.
Ideal Coated Paper Co., Brookfield, Mass.

VENTILATING APPARATUS
Canadian Blower & Forge Co., Kitchener, Ont.
Neville-Cooper Co., Toronto.

VENEER JOINTERS
Garlock-Walker Machinery Co., Toronto, Ont.

VENEER MACHINERY
Garlock-Walker Machinery Co., Toronto, Ont.
St. Joseph Iron Works, St. Joseph, Mich.

VENEER PRESSES (Hand and Power)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Perrin & Company, Wm. R., Toronto, Ont.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WALNUT LUMBER
American Walnut Mfrs. Assn., Chicago.
Frye Lumber & Veneer Co., J. W., Dayton, Ohio.
Pickrel Walnut Company, St. Louis.
Porter, Frank R. Washington, D.C.
Purcell Walnut Lumber Co., Frank, Kansas City.

WINDOW FRAME MACHINE
Atlas Mfg. Co., Orlando, Florida.

WIRE
Laidlaw Bale-Tie Co., Hamilton, Ont.

WIRE BOX STRAPPING
Cary Mfg. Company, Brooklyn, N.Y.

WOOD FINISHES
Ault & Wiborg, Toronto, Ont.
Penfound Varnish Co., Toronto, Ont.

WOODWORKING MACHINERY
General Machinery Co., Toronto, Ont.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOOD STAINS
Williams Brothers & Co

WOOD TURNING MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Yates Machine Co., P. B., Hamilton, Ont.

WORK BENCHES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOOD LATHES
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

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Brantford Pattern Works, Brantford, Ont.

One Man Does the Work of Two
with a Billstrom Glue Clamp Carrier

For every plant where much edge-gluing is done there is a real need for a Billstrom.
Here's why:—

The empty clamp is held at just the right height for the greatest convenience of the workman.
When the clamp is filled he pulls a cord, which carries the filled clamp away and deposits an empty one in its place.
One man can accomplish as much by using it as two men can do employing the old methods.
It holds the work off the floor until the glue has set, when the glued stock can be quickly removed and piled flat, thus greatly conserving space.
It reduces the labor and cost of edge gluing to the minimum.
There is a sizs to suit your particular requirements.

N. J. BILLSTROM
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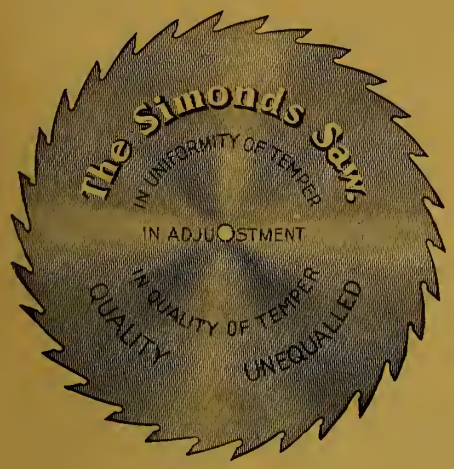

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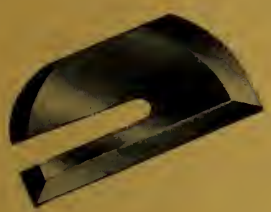
SAWS and KNIVES

Are made right. Every operation from the making of the steel to the finishing and packing is watched by experienced workmen. The latest appliances known to the metal trades are used to insure the quality of SIMONDS Saws and Knives. After each operation they are inspected by experts for defects in quality and workmanship. The result—as good a saw as human skill and science can make. Prove it to your own satisfaction. Let us quote you on the tools you need.

Simonds Canada Saw Co.
LIMITED
St. John, N.B. MONTREAL, Que. Vancouver, B.C.



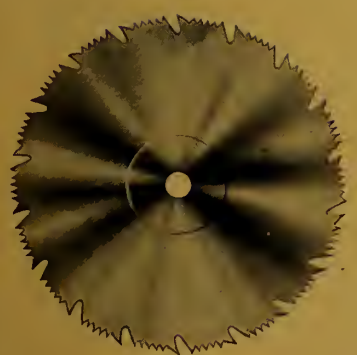
ATKINS

STERLING QUALITY

SAWS and KNIVES

mean continuous, efficient work and 100 per cent. production.

The extraordinary demand for more buildings and homes means that the Lumber output must increase.



Atkins Sterling Quality Saws and Knives will assist you in making the year 1921 the biggest and best in the history of your business.

Write to-day for our Knife Booklet "C W" and Pattern Template Paper.

E. C. ATKINS & CO.

Makers of Sterling Saws

Factory—HAMILTON, Ont. **Vancouver Branch—109 Powell Street**

"176" in factory of Western Furniture Company, Indianapolis, sanding inside curved edge of a circular cabinet panel against solid sanding roll. The curved frames on the trucks are similarly finished at a very considerable saving over other methods.

MATTISON

176

Oscillating Belt Sander

For Edge and Shaped Work

Successfully employs stationary forms

This shows a narrow-nosed form which provides an accurate and economical method for sanding the curved and flat members of both square and octagonal pieces. The sanding is done with the grain, and the stock is handled but once.

BECAUSE of its substantial construction, this sander is entirely free from vibration, making the use of special forms completely successful.

This feature provides a superior method for sanding the small, flat curves of ornamental square or octagon legs, pilasters, etc. The work is accomplished quickly, accurately and economically. Oscillation of the sandbelt improves quality by eliminating scratch marks.

Such a large variety of flat and curved edge work can be completely finished on this Oscillating Belt Sander, that no furniture factory can afford to do without it.

Send for Illustrated Bulletin Describing this Method in Detail

MATTISON MACHINE WORKS

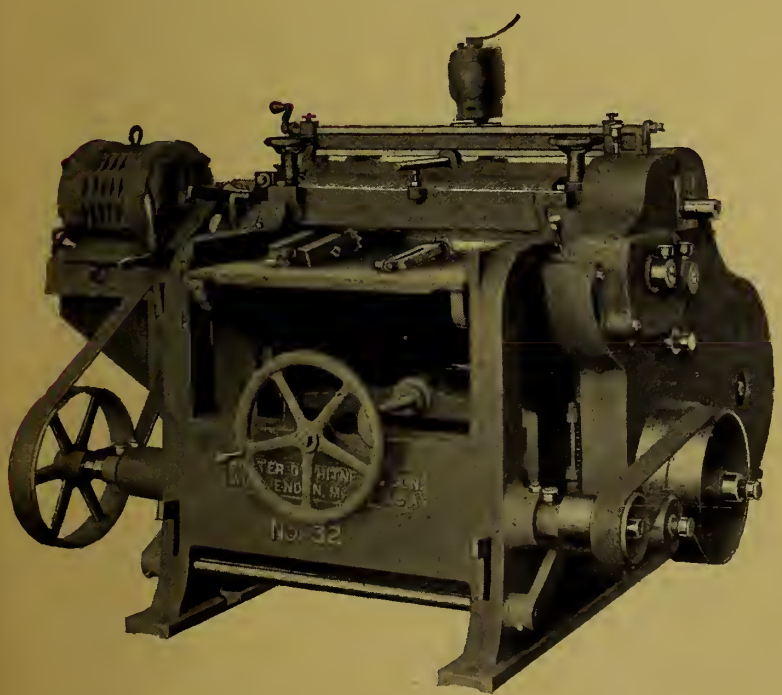
Rockford, Illinois, U. S. A.

Volume Twenty-One TORONTO, AUGUST, 1921 Number Eight

CANADIAN WOODWORKER and Furniture Manufacturer

A Whitney Direct Motor Driven Planer

Should be running in your Plant



Because it requires
No Countershaft
No Driving Belts

Saves
Belt Expense
Floor Space

Can be erected and operated without shafting.

Can be set in the most convenient place.

Machines made in seven different widths—24 in.—26 in.—30 in.—36 in. —40 in.—44 in.—48 in.

Produces better work and more of it.

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209 South State Street.

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602 Times Building,
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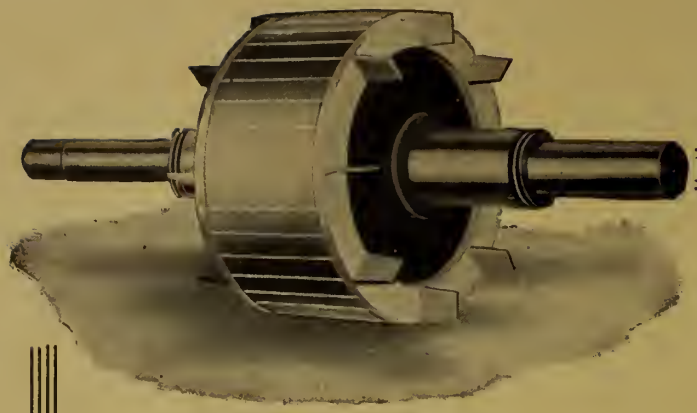
C. L. Babcock, Manager.

Canadian Representatives:
H. W. Petrie, Limited,
Toronto, Ontario.



No Soldered Joints or Bolted Connections in

Canadian Crocker-Wheeler Rotors

The greatest improvement in modern induction motor design—no soldered joints to melt and cause arcing or open circuits and no bolted connections to work loose. The risk of fire as well as the possibility of motor troubles and consequent delay, is thus greatly reduced if not eliminated entirely.

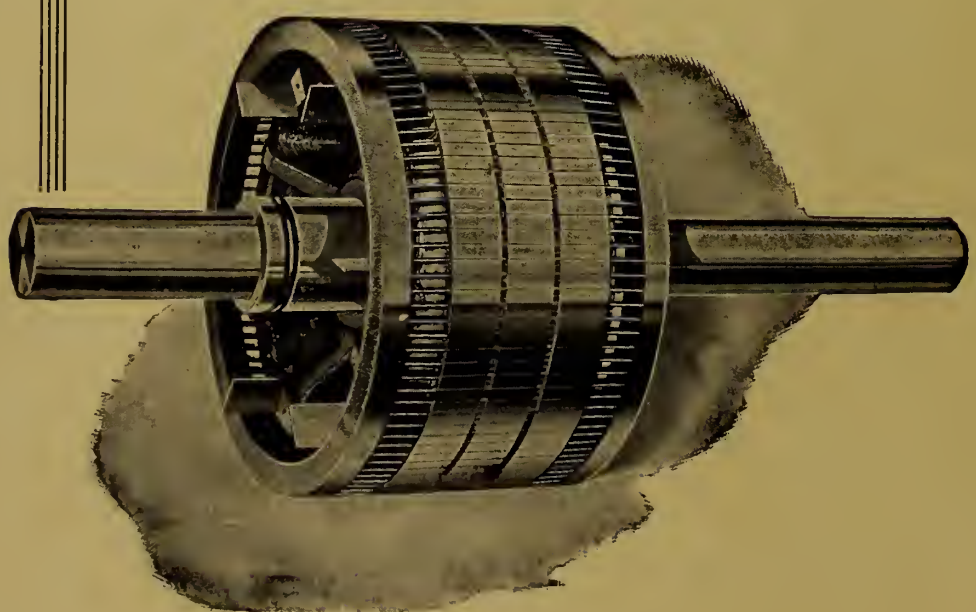
The entire Rotor Winding of small squirrel-cage iuduction motors is cast of aluminum alloy—in one operation. Thus, the complete winding is one integral structure.

The medium and large size Rotors have liberal section copper bars and the end rings are cast-welded, making perfect contact.

The generous bearing sizes and sturdiness of mechanical construction throughout, further emphasizes the superiority of our motors for woodworking plants.

Northern Electric Company
LIMITED

Montreal	Quebec	Toronto		Windsor	Regina	Edmonton
Halifax	Ottawa	Hamilton	London	Winnipeg	Calgary	Vancouver



In Stock at our Branch Houses

OUR EXHIBITION

will be held at

163 DUFFERIN STREET

Our warehouse, situated just outside the main entrance to the Canadian National Exhibition grounds. You are cordially invited to call at our warehouse any time you will be interested.

A few of the machines arranged for inspection are the following:

1—McGregor-Gourlay Double Arbor Universal Saw Table, same as C.M.C. No. 618, with 14" saws, self-contained countershaft, full complement of gauges, saws, wrenches, etc.

1—Preston No. 127 Variety Saw Table, countershaft attached, one 14" saw.

1—Ballantine 36" Band Saw, with solid lower wheel, complete with saw blades, wrenches, etc.

1—Ballantine Two Spindle Shaper, Spindles 20½" centres, diameter of spindles where collars go on 1⅛", top 42" x 42".

1—American No. 1 Single Spindle Shaper. Fig. 937 with plain countershaft.

1—C. M. C. No. 507 Mortiser, with boring attachment.

1—C.M.C. No. 624 Hand Feed Rip Saw Machine, with self-contained counter shaft, table 6'6" long by 40" wide, with plain box gauge, 22" saw blades, 1¼" arbor with cone for receiving saws different diameter.

1—Ballantine 8" Four Sided Moulder, complete with square heads and straight knives on all heads.

1—American No. 2½ Single End Tenoner, with two copes and cut-off saw attachment. Fig. 9431 in American Woodworking Machinery Catalog.

1—C.M.C. No. 646 Roller Table Cut-off Saw, sliding table 7'6" long, stationary table 50" to the saw, sliding table equipped with stop gauge, including five stops, with countershaft, complete with saws, wrenches , etc.

1—Cowan Combination Vertical and Horizontal Boring Machine, complete with wrenches, etc.

1—Hespeler 12" Buzz Planer, fitted with round cylinder, full set of knives, countershaft, wrenches, guard, etc.

1—Preston 36" Band saw, lower web wheel and guards.

8—Sections Cowan Four Screw Veneer Press 12"x50", four sections 27" clear space under screw plates, four sections 32" under screw plates.

1—24" Francis Double Roll Glue Spreader.

4—Sections Cowan Three Screw Veneer Press 38"x12", 28" clear space under screw plates.

1—C.M.C. Arm Sander, No. 438, with paper cutter.

1—Universal Knife Grinder, 37", made by American Wood Working Machinery Co., Fig. 1126 in their catalogue.

1—60" Sturtevant Single Slow Speed Exhauster, left hand, top vertical discharge, complete with platform and rods to suspend from ceiling.

1—Cowan Chain Mortiser with grinder.

1—Ballantine 36" Band Saw, lower web wheel.

1—American No. 3 Double Cut-Off Saw, new machine, capacity from 8" to 6' 9" in length, 4" thick and 30" wide.

1—American No. 25 Edging and Ripping Saw, new machine.

1—American No. 30 Double Arbor Universal Saw Bench, new machine.

1—Preston 24" No. 121 Pony Planer, used only couple of months.

1—McGregor-Gourlay 24" Pony Planer.

1—Mershon Band Rip Saw.

SPECIALS

1—Morgan Two-Arm Shock Fastener, used machine, but in firstclass condition.
1—Used Morgan Eight-roll Box Board Matcher.
1—Used Morgan 12-spindle Double Row Chucks, Open Back Nailing Machine.

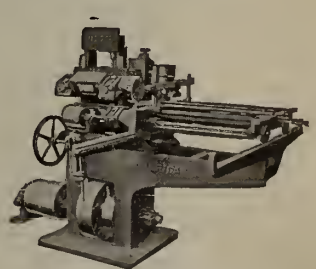
American No. 25 Power Feed Edging and Ripping Saw

Garlock-Walker Machinery Co., Limited

32 Front Street West

WINNIPEG TORONTO MONTREAL

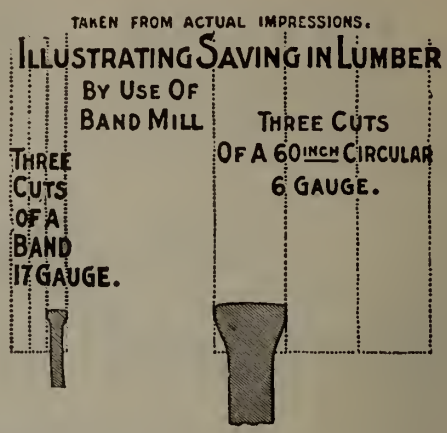
Everything in Woodworking and Metal Working Machinery



American No. 2½ Single End Tenoning Machine

MORE LUMBER and LESS SAWDUST

That is the Aim of Every Millman



NO. 361 "LIGHTNING" BAND SAW MILL

Your sawdust pile is an absolute loss to you—a reduction of your sawdust pile is real money in your pocket.

Then why continue to use a wasteful circular mill, with its big sawdust pile, when a Fay & Egan Band Saw Mill will give you more lumber and less sawdust, as shown in the diagram above, made from actual impressions.

No. 361 will give you 20 to 25 per cent. more merchantable lumber from your logs.

Brings an average of 10 per cent. higher price than average mill cut. Band Sawn lumber is free from manufacturing defects, such as uneveness, roughness, "niggerheads," etc.

Write for our Band Mill Catalog.

J. A. FAY & EGAN Company

Established 1830

World's Oldest and Largest Manufacturer of Woodworking Machinery

153-173 W. Front St. CINCINNATI, OHIO

"The Lightning" Line
TRADE MARK REG.

EXTREMELY WELL PLEASED

That's what you would say if you had a Yates 431 Endless Bed Sander in your plant. A customer wrote us who is considering installing another 431 and said:

"We have been extremely well pleased with the service which your 431 Sander has given us. As a matter of fact, it has been so thoroughly satisfactory that we are not considering, on this proposition, any other machine than your own."

What better recommendation could you want?

Our new 60-page Sander Book, fully illustrated, with a fund of information on sanding, is just completed. Get a copy.

P. B. Yates Machine Co. Ltd.

Hamilton - Canada

C.M.C.

No. 619 Dimension Saw Table

Have you a large variety of work to do on a Saw Table? Here is a handy machine, fine for production work in ripping or cutting off, but also suitable for mitreing, bevelling or grooving.

It is an efficient saw which has proved its value in piano and furniture factories, planing mills, pattern shops and sash and door factories.

Built with that thoroughness and care which is making C.M.C. tools the most popular line on the market to-day.

Let us send you further details.

CANADA MACHINERY CORPORATION, GALT, ONTARIO
LIMITED

Toronto Sales Office - - 721-2 Bank of Hamilton Building.

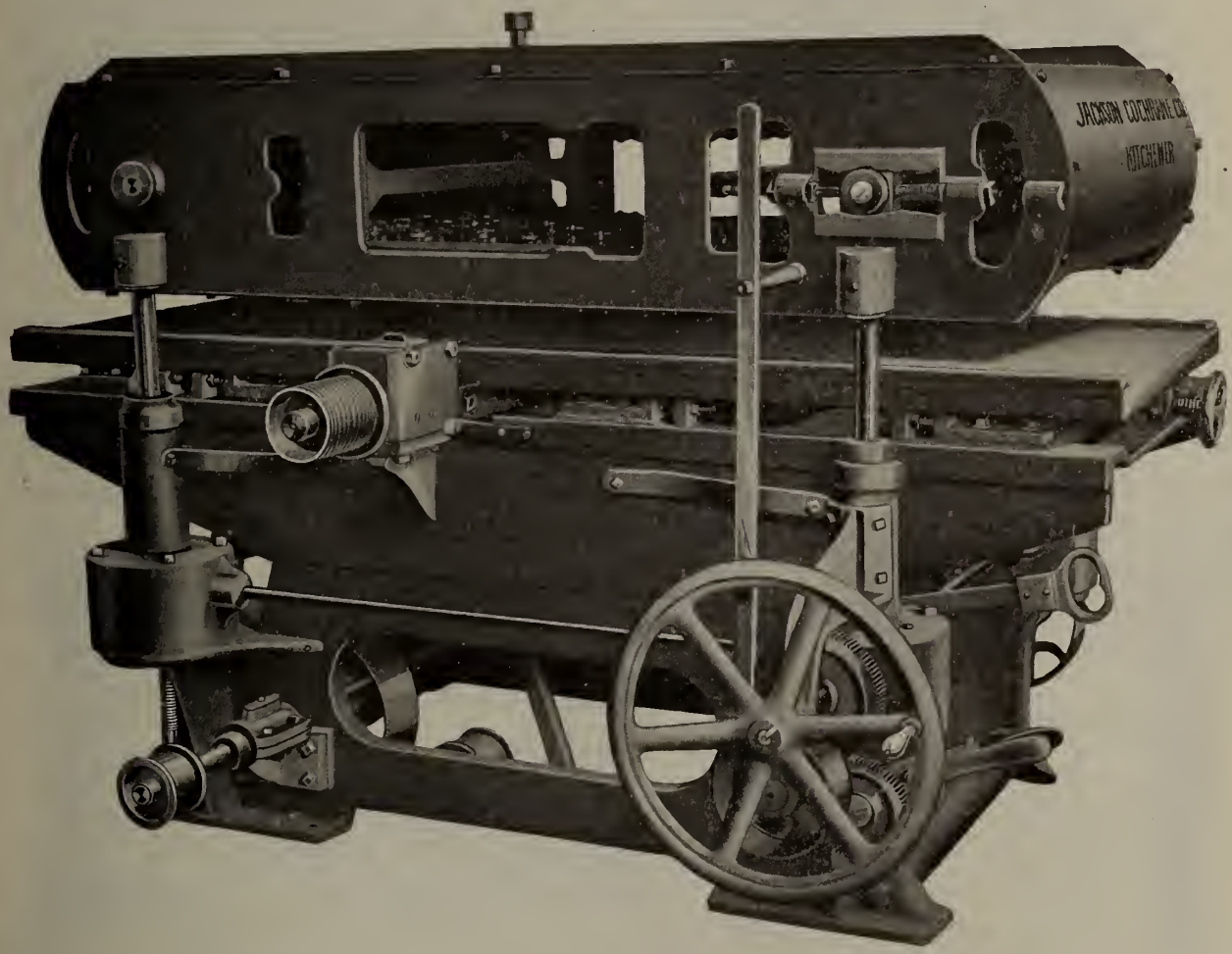
The

Herzog Self-Feed Jointer

means

Increased Production **Simplicity of Operation**
Small Floor Space **Safety to Employees**

Does four times the work of the Hand Jointer

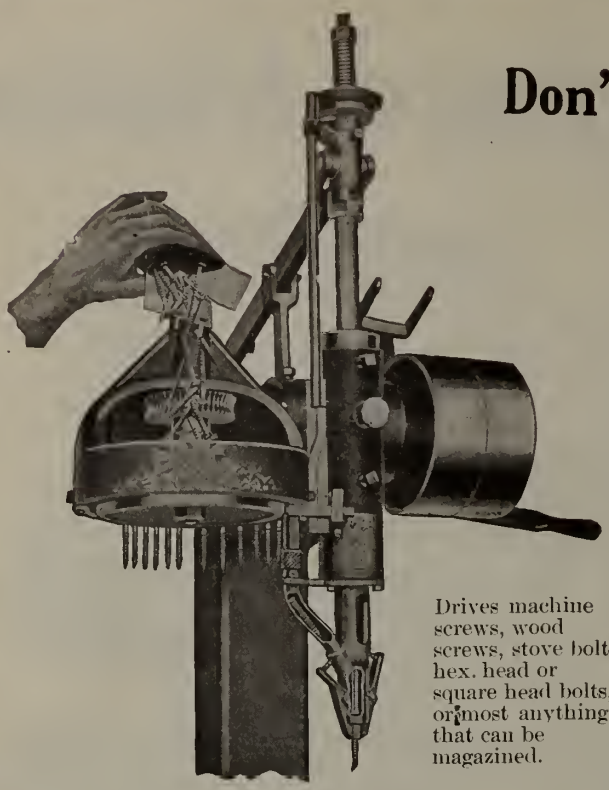


Our No. 34 Herzog Jointer, illustrated above, is one of the most efficient machines on the market to-day. It is appreciated by the manufacturer and employees alike, because, while it will produce from three to five times as much work as the hand jointer, it does not require skilled operators, but eliminates the danger so common to other makes. It can be operated by two boys. It will handle stock varying in width from 1 inch to the full width of the jointer, will feed fast or slow, takes only one-fourth the floor space of hand jointers, and requires only one-fifth of the sharpening of the knives. It is fitted with power feed raising and lowering attachment, with cylinder double belted and driven from both ends.

If interested in reducing your costs, write us

Jackson, Cochrane & Company

KITCHENER - CANADA



Drives machine screws, wood screws, stove bolts, hex. head or square head bolts, or most anything that can be magazined.

Don't waste time and money driving screws by hand

Follow the example of your competitors and install Magazine Fed Screw Driving Machines

The Reynolds Machine Co.
Department C.
Massillon, Ohio, U. S. A.

Robertson Patented Socket Head Wood Screws

Take the *high costs* out of Screw - driving

No matter whether you use automatic screw-driving machines or the hand method, you will find them far superior to work with.
Note the patented recess head as shown in the illustration. When the driver is set in it there is no chance of it slipping out and all burring is eliminated. The result is a clean, neat-appearing job that adds to the value of your product.

Many manufacturers are now using them exclusively and are all delighted with the results. **Drivers supplied free with first orders, and include** hand drivers, Yankee bits, brace bits or bits for the Reynolds machine, which gives exceptional efficiency when using recessed head screws. Send post card for free samples with bits whichwill prove our contention of double efficiency and savings in time, labor and annoyance, worth more to a large screw user than his entire outlay in buying screws.

P. L. Robertson Mfg. Co., Ltd.

Milton - - - Ontario

No. 830
Open Back Nailing Machine

Yates

Nailing Machines

are

Made Right
Right in Canada

A Yates Nailer will do your work quicker, cheaper and with greater accuracy than is possible to do by hand.

Let us send you circular and tell you the possibilities of a nailer. We will gladly do so. Write us.

P. B. Yates Machine Co. Ltd.

Hamilton Canada

H. W. PETRIE LIMITED

CANADA'S DEPENDABLE
MACHINERY and SUPPLY HOUSE

NEW AND USED
WOODWORKING MACHINERY

Let us Quote on Your Requirements

131-147 FRONT STREET WEST TORONTO

HAMILTON OFFICE: 4 KING STREET WEST

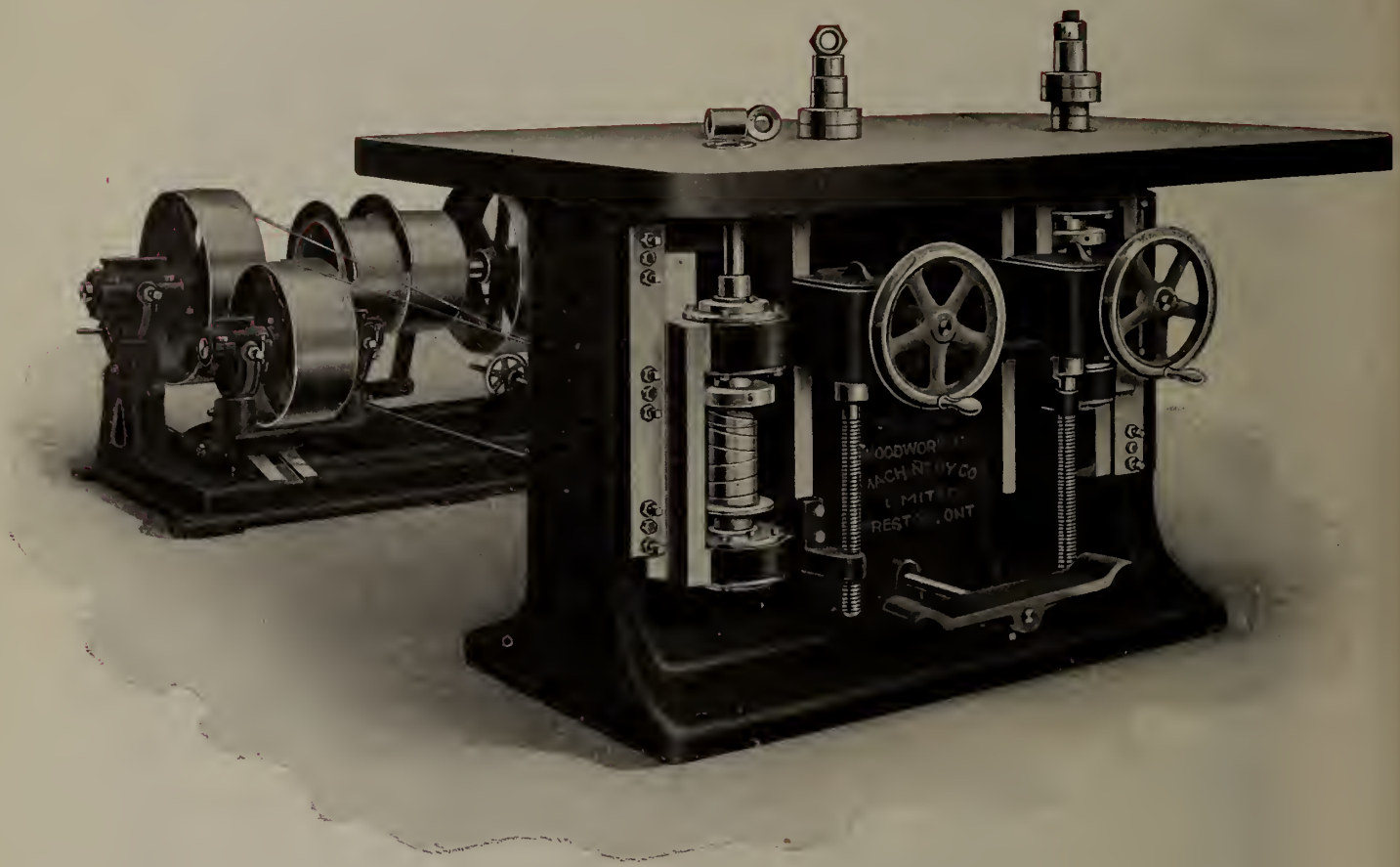
You can Double your Shaper Output

with one of our No. 162

HEAVY HIGH-SPEED BALL-BEARING SHAPERS

and you can also

Improve the Quality of your Work



May we have a chance to prove this strong statement to you when you need a Shaper?

We have specialized In Ball Bearing Shapers for twelve years and offer you a machine having every known and modern improvement. We will gladly furnish you with the names of a hundred users as proof of our claims.

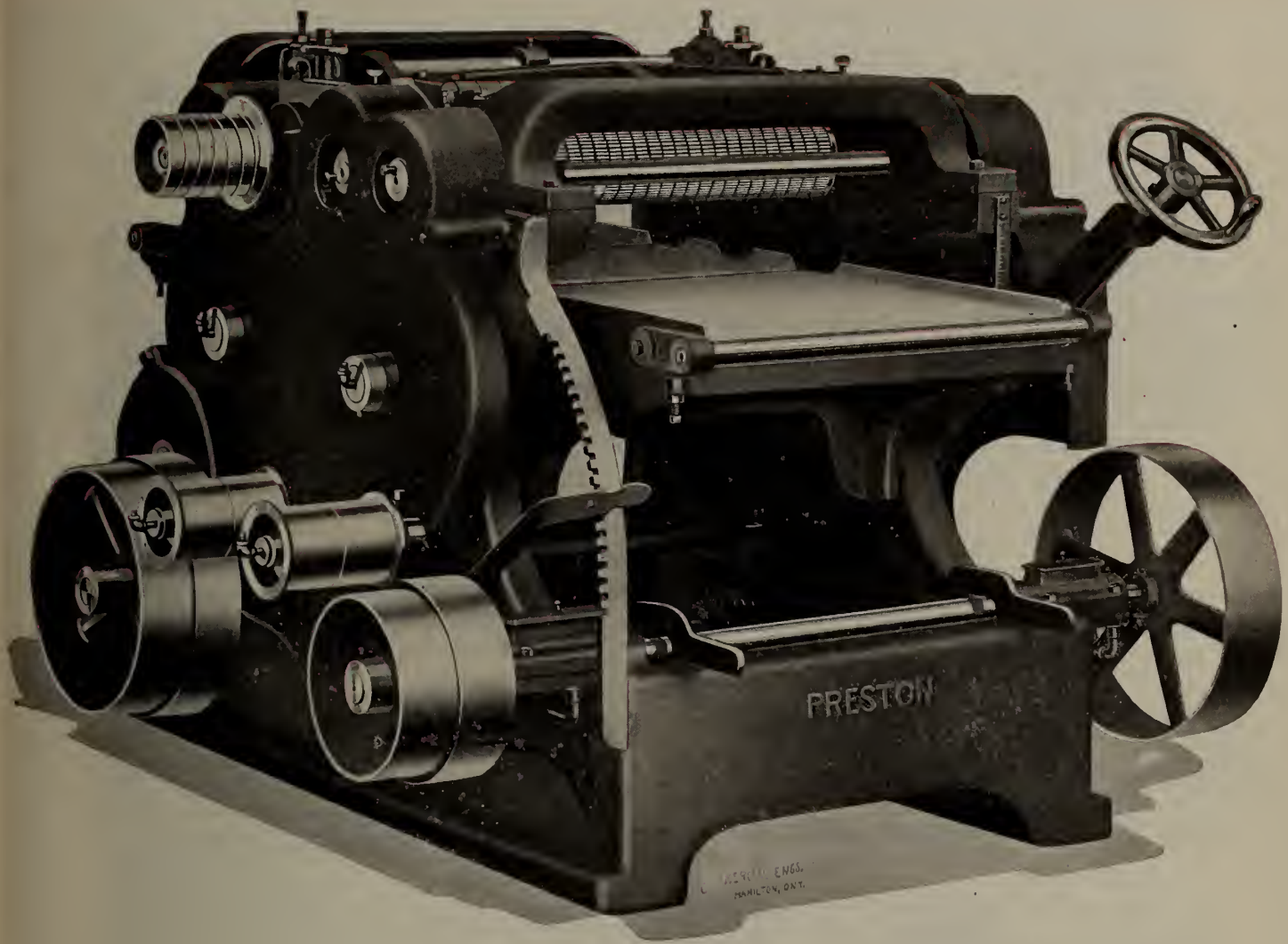
PREDOMINANT FEATURES—Spindle speeds, 7,000 to 12,000 r. p. m. Specially selected S. K. F. Ball Bearings. Weight, 2,750 pounds. Built with either one or two spindles.

The Preston Woodworking

PRESTON,

Premier Manufacturers of Ball Bearing Shapers in Canada

Introducing a New High Speed Ball Bearing Surface Planer



(1) Specially selected S. K. F. Ball Bearings
(2) Sectional Roll and Sectional Clipbreaker
(3) Round Cylinder with 4 High Speed Knives
(4) Stockbridge Knife Grinder and Jointer
(5) Cylinder Speed, 5000 r. p. m.

The above is a cut of our No. 123--30 in. single surface planer recently shipped a customer. We have supplied a number of them within the last two years, equipped exactly as above, and would gladly show you the machines in operation in the different plants where sold.

Machinery Company, Ltd.
ONTARIO

We are the Sole Manufacturers and Agents in Canada of the Eaglesfield Patented Beltless Swing Saw—See advertisement page 12.

At the Toronto Exhibition

be sure you see the

"WILLIAMS" EXHIBIT

IN MACHINERY HALL

Among other up-to-date equipment especially interesting to owners and superintendents of woodworking plants, you will see the new style

C. M. C. RIPPING and JOINTING SAW (No. 613)

This machine has been especially designed to accommodate those who have a quantity of light ripping, but not sufficient to justify the use of the heavier machine—No. 611. While somewhat lighter in construction than No. 611, and having a smaller feed range, the new machine is practically identical with it. You will see also the new

C. M. C. SELF FEED RIP SAW (No. 605)

which is a radical departure in design and embodies many features not found on any other self feed Rip Saw on the market.

Many Other Interesting Features in this big Machinery Exhibit

Here you will see the most up-to-date machinery and equipment for the machine shop, foundry and woodworking factory. Many of the machines will be in constant operation, thus giving you an excellent opportunity to judge of their efficiency.

Don't forget—Toronto Exhibition - August 27 - September 10—and go straight to the Main Entrance of **Machinery Hall** where the "Williams" Machinery Exhibit is—a feature that you will find both instructive and enjoyable.

The A. R. Williams Machinery Co. Limited

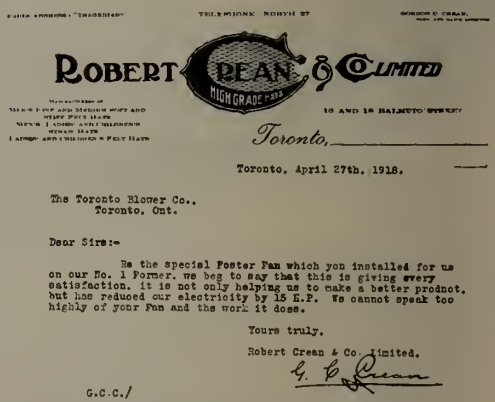
64 FRONT ST. WEST - TORONTO

HALIFAX, N.S. ST. JOHN, N.B. MONTREAL, P.Q. TORONTO, ONT.
VANCOUVER, B.C. WINNIPEG, MAN.

If It's Machinery—Write "WILLIAMS"

Here is the Proof →

This is conclusive proof of the efficiency of the FOSTER FAN under an unusually severe test.



ROBERT CREAN & CO. LIMITED
HIGH GRADE FURS
10 AND 12 HALMUTO STREET

Toronto, April 27th, 1918.

The Toronto Blower Co.,
Toronto, Ont.

Dear Sirs:-

Re the special Foster Fan which you installed for us on our No. 1 Former, we beg to say that this is giving every satisfaction, it is not only helping us to make a better product, but has reduced our electricity by 15 H.P. We cannot speak too highly of your Fan and the work it does.

Yours truly,

Robert Crean & Co. Limited.

G. E. Crean

G.C.C./

We are Specialists

We design, install and guarantee our systems from the making of the fan right down to the finest detail of installation.

PATENTED

Heavy Sheet Iron Work a Specialty

← THIS IS THE FAN THAT SAVED 15 H.P.

The "Foster Fan"—the heart of our blower systems—is of special design, being the only non-centre suction fan on the market.

It will handle any conceivable material continuously – without clogging, and is the only suction fan having a bearing on the inlet side, thereby eliminating the over-hung wheel. These fans are equipped with special ball bearings, and if desired are also equipped with special ball bearing loose pulley.

Let us demonstrate the most satisfactory exhaust system in Canada.

TORONTO BLOWER COMPANY

156 Duke Street **TORONTO, Ont.**

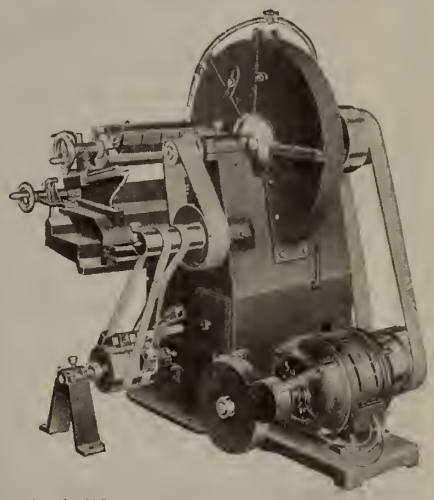
"Oliver" No. 80 Variety Saw Bench Direct Motor Drive. Ballbearings.

"Oliver Quality"

Woodworking Machinery

It takes a 304-page Catalog to describe the "Oliver" High-grade Furniture-making and other Woodworking Machinery. May we send you a copy? Let us know your wants, we may have other literature of interest to you.

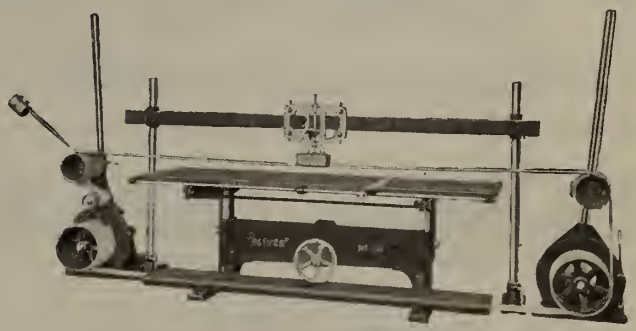
"Oliver" Pony Planer. This is also buil with direct motor drive. Line includes fast feed double Surfacers.



We build a large line of straight and cupwheel knife grinders, from the smallest to the largest sizes.

OLIVER TOOLS

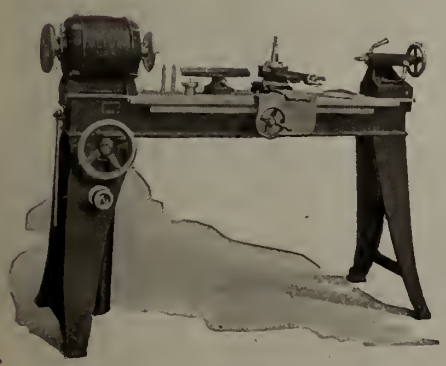
Saw Benches	Sanders
Swing Saws	Boring
Saw Sharpeners	Machines
Re-Saws	Mortisers
Band Saws	Tenoners
Jig Saws	Shapers
Surfacers	Trimmers
Jointers	Grinders
Wood Lathes	Vises
Glue Heaters	



"Oliver" Belt Sander. Also build Variety, disk, spindle, and drum sanders. Ask for particulars.

"Oliver" Woodworking Machinery are built of strictly High-grade Materials, from most Improved Design and types by Real Mechanics.

We solicit the opportunity of convincing you if you are interested.

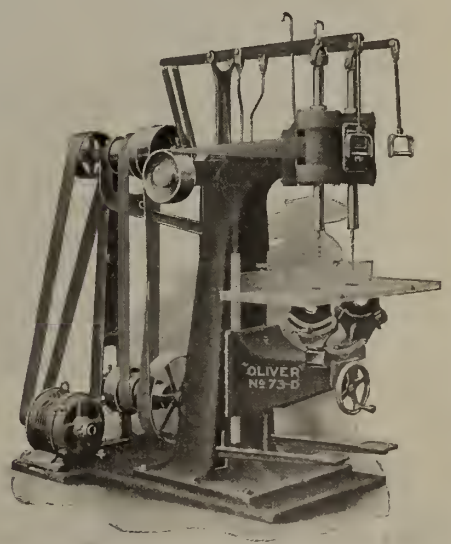


"Oliver" No. 51 Motor Head Speed Lathe (Just one of a big variety).

Oliver Machinery Co.

Grand Rapids, Mich., U.S.A.

"Oliver" Oilstone Grinder.



"Oliver" Boring Machines are built one or two spindle, also horizontal.

The Shimer Round Safety Cylinder with High Speed Knives

A Round Safety Cylinder that will Appeal to the Buyer and the User for three Reasons:

The first is our adjusting nut for setting the knives. It is the only cylinder with properly located adjusting nuts for setting the knives, which, with our way, can be set to 1-1000 of an inch.

The second is our way of holding the knife without tapping into the head.

The third is the correct angle of cut for the knives.

Made for Any of the Different Makers' Machines and in Any Length Cylinder.

WRITE FOR PRICES

SHIMER CUTTER HEAD CO. OF CANADA, LIMITED

Manufacturers of Cutter Heads, Safety Cylinders and Grinders

GALT, ONTARIO

The Mereen-Johnson Resaw

has many features of advantage which place it far ahead of anything in the Resaw field.

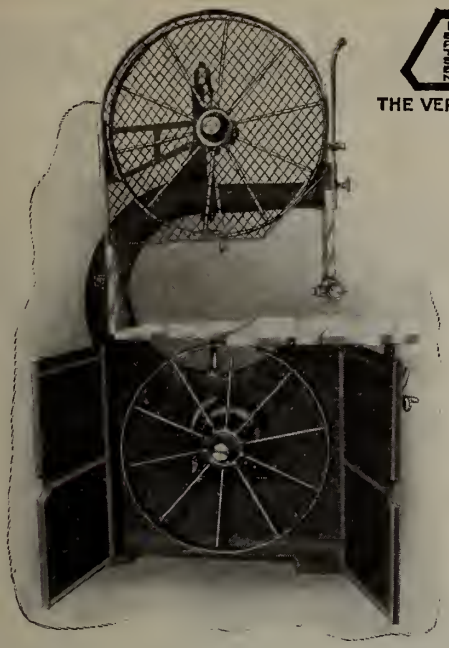
No pulleys—no belts—no frictions.

The sprocket and chain arrangement for changing speeds is only one of the many improvements on this machine.

Write for circular.

Mereen-Johnson Machine Co.

Minneapolis Minnesota, U.S.A.



THE VERY BEST

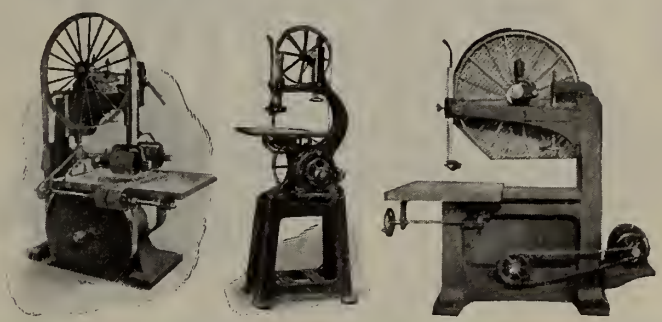
West Side

Plain, symmetric, a model of concise, compact design, a West Side band saw offers utmost capacity for good work. A machine for every purpose, each possessing very real advantages of operation.

We would particularly direct attention to the uncommon strength of our band saws. They are of liberal proportions where the strain comes. They stand up to constant work under hardest usage.

A New Motor Driven 36" Band Saw

--shown to the left. Most convenient of all to use. Its every adjustment is reached without change of position for the operator. A perfectly balanced machine on which best work and satisfactory production are assured.



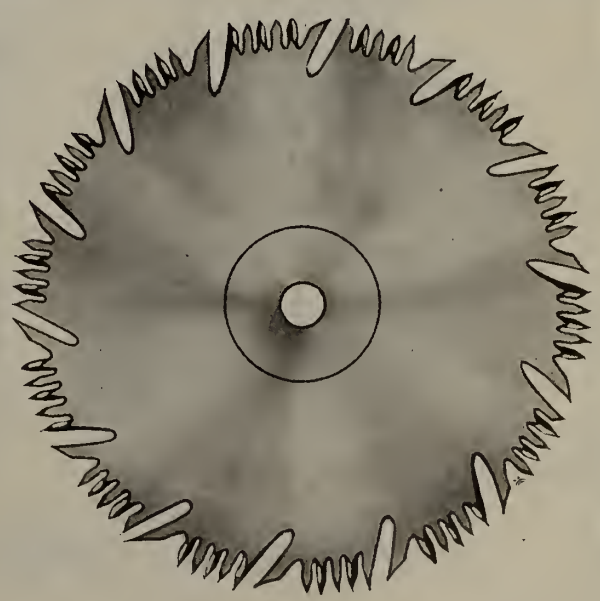
Write us now for information which should help in a wise choice of band saw; direct motor drive--belt drive--gear drive-

West Side Iron Works

Factory: Grand Rapids
General Offices: Chicago.

CIRCULAR MITRE SAWS

These saws are ground to run without set; especially adapted for smooth cutting such as cabinet and cigar box work.
When ordering, give size of centre hole, also diameter of collars on mandrel.



Radcliff Saws are manufactured from the highest quality crucible steel of a formula especially adapted to retain their tension and cutting edge longer than all others. The guarantee accompanying every Beaver Brand Saw is your protection.

We also handle Machine Knives, Hoe Shanks and Bits, Saw Tools, Emery Wheels, Files, Belting, Shafting, Pulleys, Hangers and Filing Room Machinery.

Radcliff Saw Manufacturing Company, Limited

1550 Dundas Street West TORONTO, ONT.

AGENTS FOR L. & I. J. WHITE CO., MACHINE KNIVES

Speed + Perfect Joints = Low Costs

The Taylor TRADE MARK

CLAMP CARRIER

for

Small Jobs in the Big Plant
All Jobs in the Little Plant

1. Natural standing position of operator.
2. No Juggling of heavy clamps.
3. No bending or walking.
4. No pile to overturn to get work glued first—simply move clamp one section.
5. Less space than equal number of clamps with work in, piled on the floor.

Any size to suit your work. 8 and 12-section wheel type. 16, 20, 30 and 40-section chain type. 4, 5 or 6 clamps per section for stock up to 42-in. wide.

Representatives:
A. R. Williams Machinery Co., Toronto, Canada

James L. Taylor Mfg. Company
Poughkeepsie, N.Y., U.S.A.

MILL PIPING

Shaving and Sawdust Collecting Systems Installed Complete

ALTERATIONS — REPAIRS

Neville-Cooper Co.
130 Ontario St. Toronto
Phone Main 2157

We also manufacture and erect Smoke Stacks, Boiler Breechings, Metal Cornices, Skylights, Eavetrough, etc.

"CASCO" Waterproof Glue

Mixed Cold—Used Cold

Simple to prepare—can be applied with your present equipment. Comparative tests have convinced thousands of manufacturers of the merits of "CASCO" for jointing and veneering, both from the standpoint of quality and cost. Why not let us tell you about it?

The Casein Manufacturing Co.

Manufacturers of Casein Glues for twenty-five years
15 PARK ROW NEW YORK CITY

NOTE. Send for Casco Red Book. It contains much information on glue, veneer and panels.

Borer 321

Tilting and Plain Table.
Simple to Adjust. Easy to Operate.
Strong, Steady and Accurate.
Spindle 12 in. from post; travels 6 in.
Table 14 in. x 28 in.
Adjusts 15 in. Vertically.

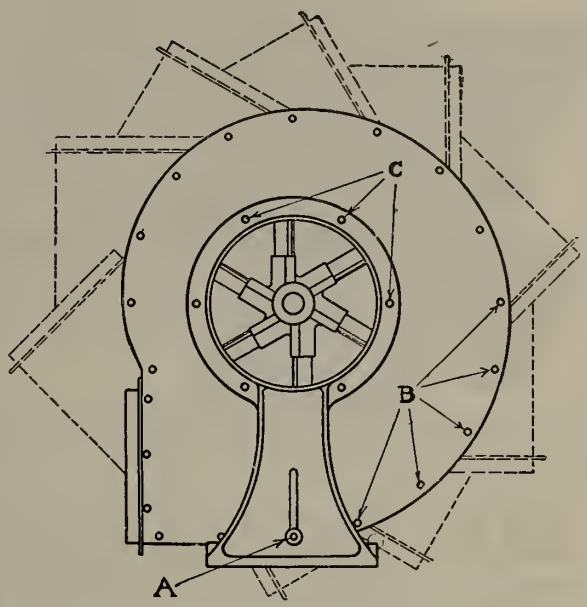
Prices of this or other WOODWORKING MACHINERY on application.

Cowan & Company of Galt

Limited

Galt Ontario Canada

Reversible Housing



One of the features of the Canadian Planing Mill Exhauster is the reversible housing. It is easily adjustable to either hand and to any discharge.

By this arrangement one fan may be used to meet all requirements, thus eliminating crossed belts and sharp angles.

Let our engineering department help you plan your refuse exhauster system.

Write for catalogue 400-13.

Canadian Blower & Forge Co.

KITCHENER, ONT.

Will It Spin?

? Not This One !

If that wheel should spin—even a little bit—at the end of each board passing under it, how accurate would you consider the record of footage?

The Productimeter

On **this** Lumber Meter the wheel **can't** spin—hence the record can be counted on **absolutely.**

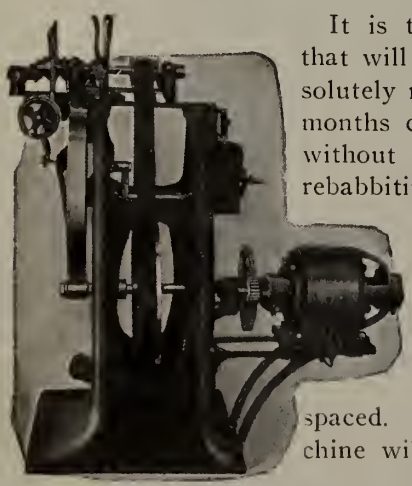
Let us send you one on 30 days' trial.
It will earn its cost by the saving it makes.

Durant Manufacturing Co.
615 Buffum St. Milwaukee, Wis.

The Berry Combination Band and Circular Automatic Saw Sharpener

Belt or Motor Driven. Capacity: Bands, 3-16" to 4", Circulars 4" to 32". Simple, Universal, Automatic in Action.

It is the only *combination* grinder that is *automatic*



It is the only grinder that will grind a saw absolutely round after three months continuous use—without readjustment or rebabbiting. It will take an unevenly spaced, hand-filed saw and make it perfectly round and even spaced. No other machine will do this.

For All Shops Using Circular or Band Saws

The Berry Tooth is far superior to the ordinary peg tooth. All teeth are alike, evenly spaced—ground right from the center. A saw ground with this machine does twice the work in half the time.

Write for Booklet to-day.

O. V. HOOKER & SON
St. Johnsbury Vermont

"INTERNATIONAL" Electric Glue Heaters

1 pint to 50 gallons

Fireless cooker construction holds glue at correct working temperature without guess work.

Built in sizes for all classes of shops and factories—from one pint to 50 gals. Operates on less current than any other electric glue heater.

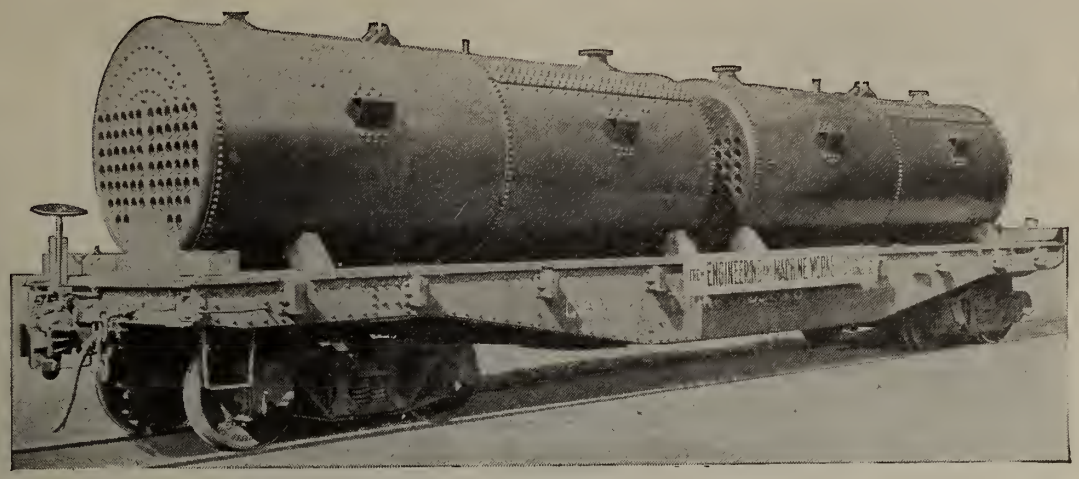
Write for bulletin "Correct Temperature in the Glue Room" and complete information about International Electric Glue Heaters.

INTERNATIONAL ELECTRIC COMPANY
MANUFACTURERS
ELECTRICAL HEATING APPLIANCES
INDIANAPOLIS, U.S.A.

Canadian Distributors
R. E. T. PRINGLE, LTD.

TORONTO
95 King Street East
WINNIPEG
703 Confederation Life Bldg.
MONTREAL
401 New Birks Bldg.
VANCOUVER
402 Vancouver Block

"International Electric Heaters are Better."



We believe the tide has been definitely turned

Canada will show a quicker return to prosperity than any other country in the world. We believe, from the very satisfactory Boiler orders we have received lately that business is on the upward turn and that wide awake plants everywhere are providing for it. Now, that our prices and deliveries are exceptionally favorable, is the time for you to put in those good new Boilers-we make them.

Engineering and Machine Works of Canada, Limited

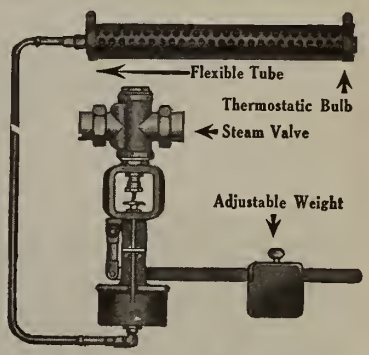
St. Catharines, Ont.

Eastern Sales Offices:
Hall Machinery Co., Sherbrooke Que., and Birk's Bldg., Montreal

ECONOMY →

Correct Kiln Control

By installing an automatic heat regulator, you relieve yourself of the danger and worry of damaged material. Get real heat control—now—by installing



The Powers Regulator
No. 15
For control of Air Temperatures in Kilns, Ovens, Drying Rooms, etc. Entirely self-contained, requiring no air or water pressure for operation.

The Powers Heat Regulator

Built on a scientific basis—it is especially designed to control temperature in drying rooms, ovens, kilns, etc. Entirely self-contained, automatic, accurate and reliable.

During more than thirty years of practical investigation and study of temperature control we have gathered a fund of information which can be applied with profit in your plant. Powers Heat Regulators will give you profitable control over conditions which you are now leaving to the judgment of more or less intelligent "help." A Powers Heat Regulator will eliminate the guesswork and the risk in those processes where heat is a factor. We manufacture a type of regulator for practically every industrial process.

State your heat problem to us and we will show you how to save money, increase profits and improve results.

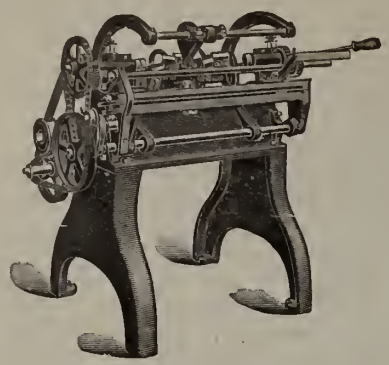
The Canadian Powers Regulator Co.

Specialists in Automatic Heat Control

82 Chesnut Street **Toronto, Ont.**

(1024 C)

↑ SATISFACTION



PROTECT YOURSELF

Against lowering prices by WORKING YOUR WASTE into turned work of various kinds.

The 22 inch No. 2 OBER LATHE shown above will turn a large variety of work that can be made from waste and other low grade timber.

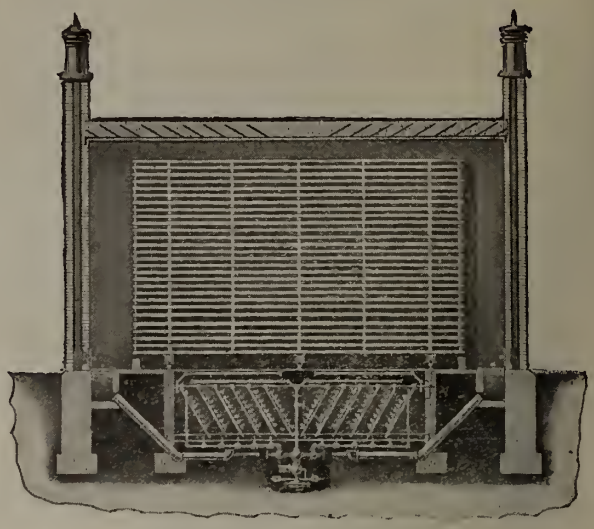
We also build other machines for doing other turned work.

Write for free catalogue No. 31

THE OBER MFG. CO.

CHAGRIN FALLS. O., U.S.A.

Thermo-Myst System



BEFORE YOU BUILD

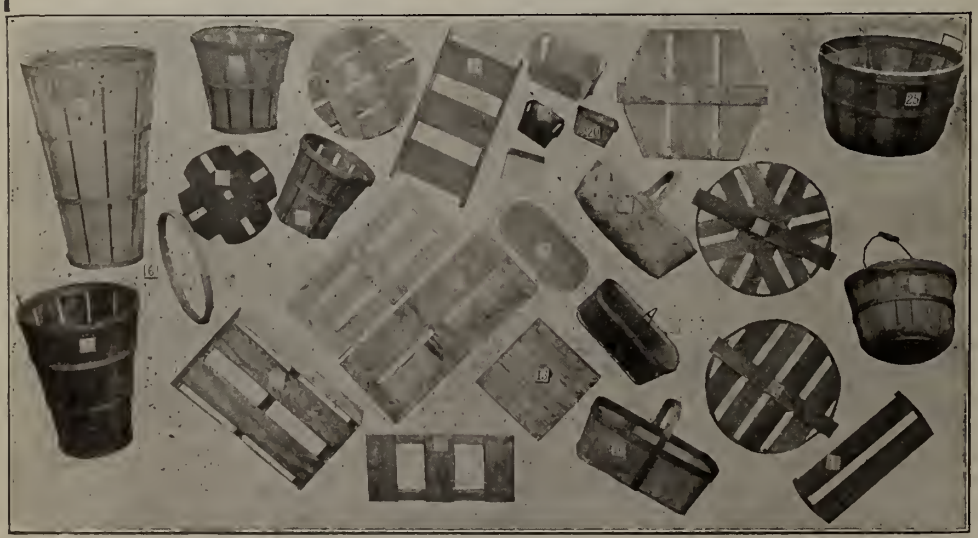
DRY KILNS

Investigate the merits of our system. Catalog and layouts mailed on request.

Curtis-Hosey Dryer Co. of Canada

177-179 Duke Street, MONTREAL, P.Q

THIS IS THE NAME



of the Machinery for the Rapid Production of

Veneer—Crates—Baskets—Fruit Packages.

"St Joe"

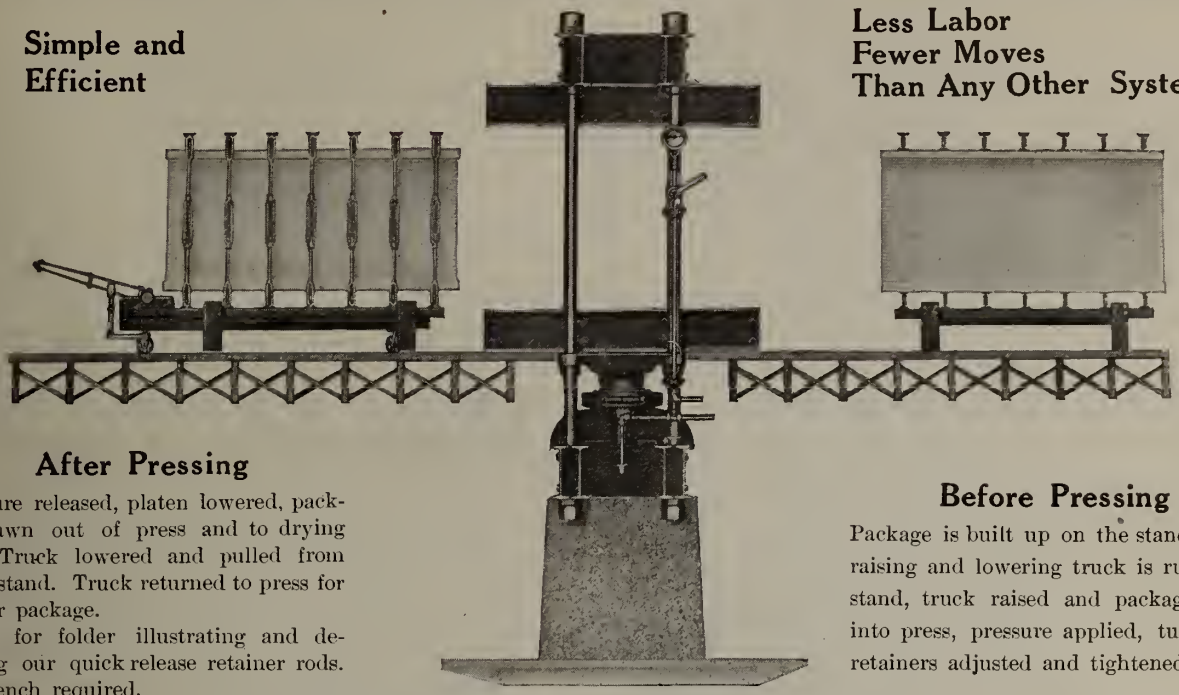
Get the name fixed in your mind.

ST. JOSEPH IRON WORKS, St. Joseph, Michigan

The Van Atta System of Veneer Package Pressing & Handling

Simple and Efficient

Less Labor
Fewer Moves
Than Any Other System



After Pressing

Pressure released, platen lowered, package drawn out of press and to drying floor. Truck lowered and pulled from under stand. Truck returned to press for another package.

Write for folder illustrating and describing our quick release retainer rods. No wrench required.

Before Pressing

Package is built up on the stand. Specia raising and lowering truck is run under stand, truck raised and package drawn into press, pressure applied, turnbuckle retainers adjusted and tightened.

E. B. VAN ATTA & CO., Inc.
Manufacturers of Hydraulic Presses and Pumps
OLEAN, N. Y.

NEW YORK OFFICE
50 Church Street

CHICAGO REPRESENTATIVE
Fader Machinery Co., Inc.
549 Washington Boulevard

FOR 25% MORE POWER

FOR PULLEY ADHESION

FOR LIGHT RUNNING

CHICAGO RAWHIDE BELTING

No Bark, Acids, Lime or other Injurious Chemicals used in the Cure

YOU GET THE FULL STRENGTH AND PLIABILITY OF SELECTED SWISS HIDES

TRANSMITS PERFECTLY AT 7500 FEET PER MINUTE
Breaking Strength 5440 pounds per Square Inch
Guaranteed Not to Stretch

MECHANICAL LEATHERS LIMITED

126 Garden Avenue, Toronto

Canadian Representatives — For Chicago Rawhide Manufacturing Company

If made of hide for mechanical purposes we have it

Eliminate The Sanding

Save Time Save Labor

Wasted time and unnecessary labor are evidences of inefficiency and excessive costs.

You will eliminate one big source of wasted energy, time, labor and money and reduce production costs materially through the use of

Troy Magic Veneer Tape

Made of special Troy Kraft Paper, heavily and uniformly gummed with "Troy Magic" glue, this tape adheres instantly, sets quickly and sticks like mortar in a solid brick wall.

Yet with a few moments' soaking, it may be ripped off in one piece—easily—leaving the surface clear, clean and smooth; no need of sanding or scraping, which other methods incur.

Write us for sample roll and prices of Troy Magic Veneer Tape.

We also manufacture cloth veneer tapes, samples of which we will gladly send you upon request.

The
Gummed Products Co.
TROY OHIO

TROY SEALING TAPES

CANADIAN·NASHUA·PAPER·CO·LTD
SERVICE PRODUCTION NASHUA QUALITY
TRADE MARK
PETERBOROUGH ONT.

NASHUA Veneer Tapes

Are manufactured with a view to giving the consumer the material for his purpose, and we stand ready to develop any special requirement for you.

In purchasing our tapes you are assured of prompt, **service** guaranteed **quality** and a reasonable **price.**

Samples of our stock will be sent upon request, so that you may try them out in your plant in a practical way.

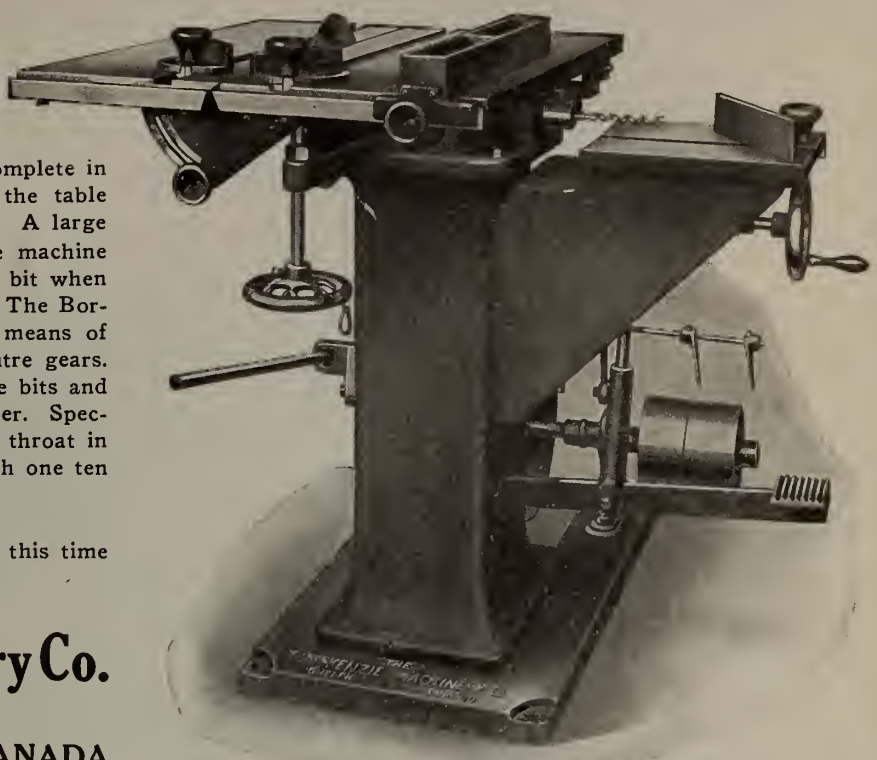
CLOTH and PAPER
Guaranteed Veneer Tapes

THE CANADIAN NASHUA PAPER CO., Ltd.
Peterborough, Ont.

The Handiest Machine on the Market

The Split-tilting table (Patent Applied For) can be tilted and locked at any angle up to forty-five degrees as indicated on the graduated segment. This machine is also supplied with a solid table. The Boring Attachment is very complete in itself. A foot lever is connected with the table which slides back and forth on the knee. A large coil spring located in the column of the machine automatically releases the work from the bit when pressure is removed from the foot lever. The Boring Attachment is raised or lowered by means of a handwheel connected with a pair of mitre gears. The spindle is bored to take standard size bits and can be arranged for a hollow chisel mortiser. Special cutters may be used by removing the throat in the table. Each machine is furnished with one ten inch saw, belt and wrench.

Write for prices and pamphlet describing this time and labor saver more fully.



Cross-cut Mitre & Rip Saw Machine showing Split-Tilting Table & Boring Attachment

D. McKenzie Machinery Co.
MANUFACTURERS
GUELPH, ONT. CANADA

MAPLE LEAF SAWS

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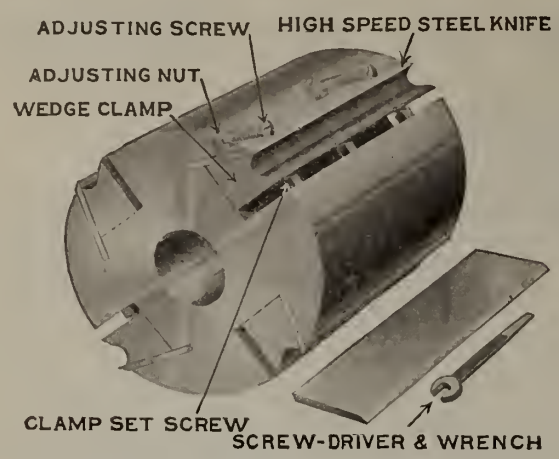

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There are over 3,000 of these Heads in daily use.
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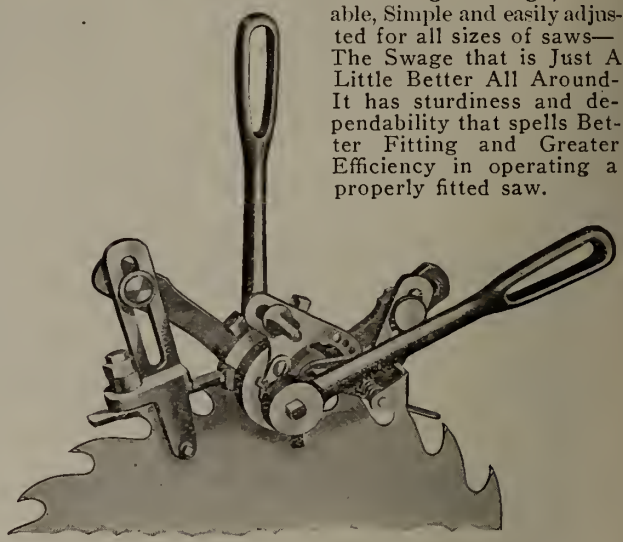

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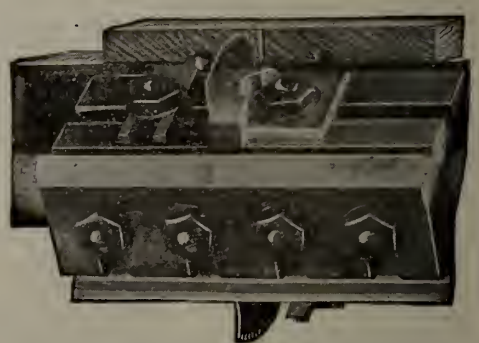
The Shuff Sticker Saw Head Attachment



Canadian Patent No 212337

This attachment will double your moulder production, widening its range of performance and effecting a real saving in the running of pully stiles, blind stops, cove, parting stops, window stops, fillet, glass bead, base moulding, ceiling, lattice moulding, screen moulding, base shoe, quarter round, stools, panel moulding, etc. Used for splitting moulding when two or more are run at the same time, a decided improvement over the flat knives for this purpose ; also used for rabbeting and grooving.

The attachments are furnished in pairs of rights and lefts, are made of solid brass, each pair properly balanced and saws sharpened and set before shipment. Made in all sizes to fit any moulder. When ordering send sketch of end view of sticker head. Cut smooth and are easily set up. Price $30, 00 in American funds f.o.b. Waukesha, Wis.

Manufactured by

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STANDARD QUALITY

The Picture Shows The Present Home of

PERKINS 183

TRADE MARK (Reg. U.S. Pat. Off.)

Our Canadian Factory is located at Hamilton, Ont.

This growth has been made possible because the majority of the glue using trade was alive to the opportunity of

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Process and Product Patents covering Perkins Glue were granted July 2nd and March 19th, 1912, and have been held valid and infringed by the United States Circuit Court of Appeals. Patents have also been granted in Canada, Great Britain, Germany, France, Belgium, Italy and other foreign countries.

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Sales Office:
South Bend, Indiana

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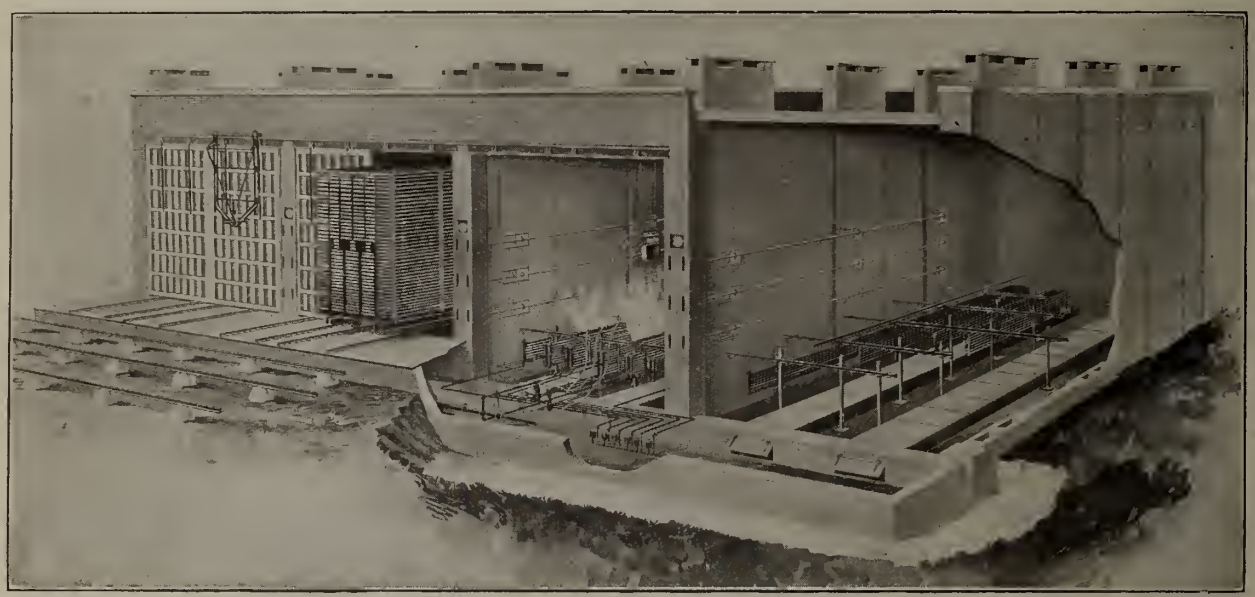

The First Kiln in 6,000 years in which Humidity is Automatically Controlled.

Please note Mr. James Malcolm's letter of June 10, 1921.

Lumber dried and cured in these Kilns is used in the manufacture of the **HIGHEST GRADE FURNITURE** and **MUST** be in **PERFECT CONDITION.**

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Manufacturers of HIGH GRADE
DINING ROOM—BEDROOM—LIBRARY SUITES.
Established 1863. Kincardine, Ontario,

Mr. C. A. Fields, June 10, 1921.
c/o National Dry Kiln Co.,
P.O. Box 55, Toronto, Ont.

Dear Sir:—

We have just completed the second lot of Lumber, dried in your new Kiln, and we are so delighted with the operation that we cannot refrain from writing to express our appreciation.

As you know, we have had several Kilns in the past, of indifferent efficiency, and when this job was installed, we spared no expense in living up to the specifications demanded by you. The results have justified everything we have done, and we wish to say that we can heartily recommend this kiln to any prospective Customer.

We are,
Yours very truly,
THE ANDREW MALCOLM FURNITURE CO., LTD.
Per James Malcolm,
President.

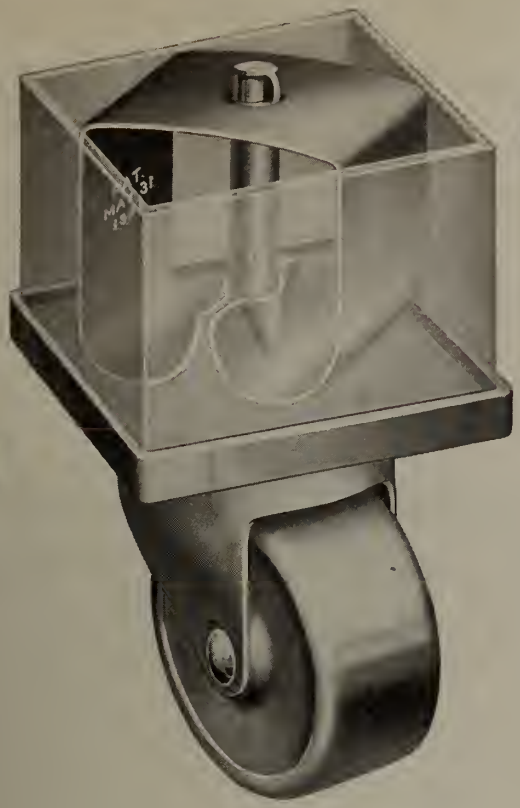
JM/MM

The NATIONAL DRY KILN CO., 1117 East Maryland Street, Indianapolis, Indiana

or

C. A. Fields, Canadian Representative, P.O. Box 55, TORONTO, Ont.

NATIONAL DRY KILNS



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This caster is made in both ball and roller bearing types. Up to 1½ in. size it is furnished with cupped washers. Above that size, with leg mounts.

When ordering kindly specify maple, lignum vitae, steel, iron or fibre wheels.

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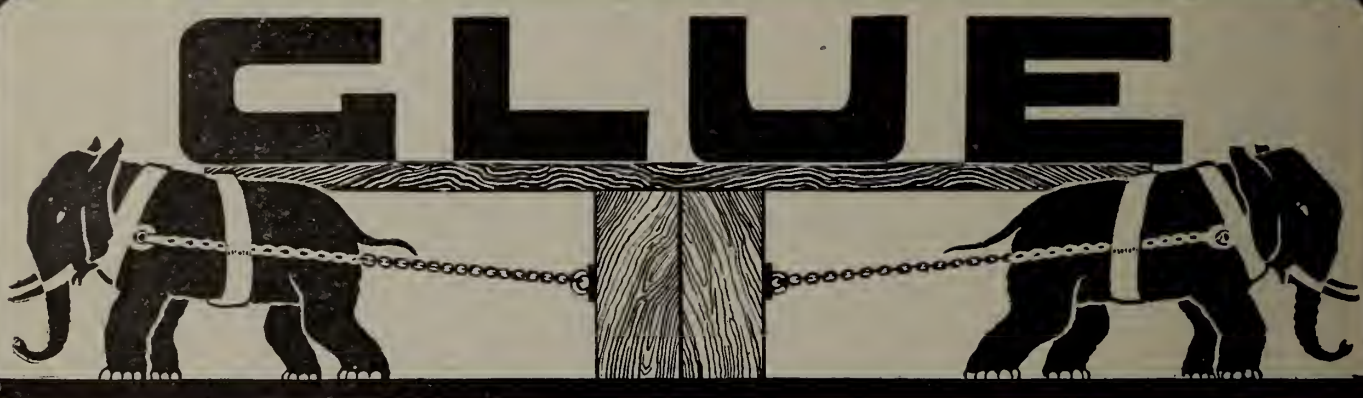

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We Specialize in Quartered WHITE OAK and POPLAR

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Advertisers will receive careful attention and liberal treatment. For manufacturing and supply firms wishing to bring their goods to the attention of owners and operators of saw and planing mills, woodworking factories, pulp mills, etc., "The Canada Lumberman" is undoubtedly the most direct and profitable advertising medium. Special attention is directed to the "Wanted" and "For Sale" advertisements. Sample copy and full information on request. Head Office, 349 Adelaide St. West, Toronto.

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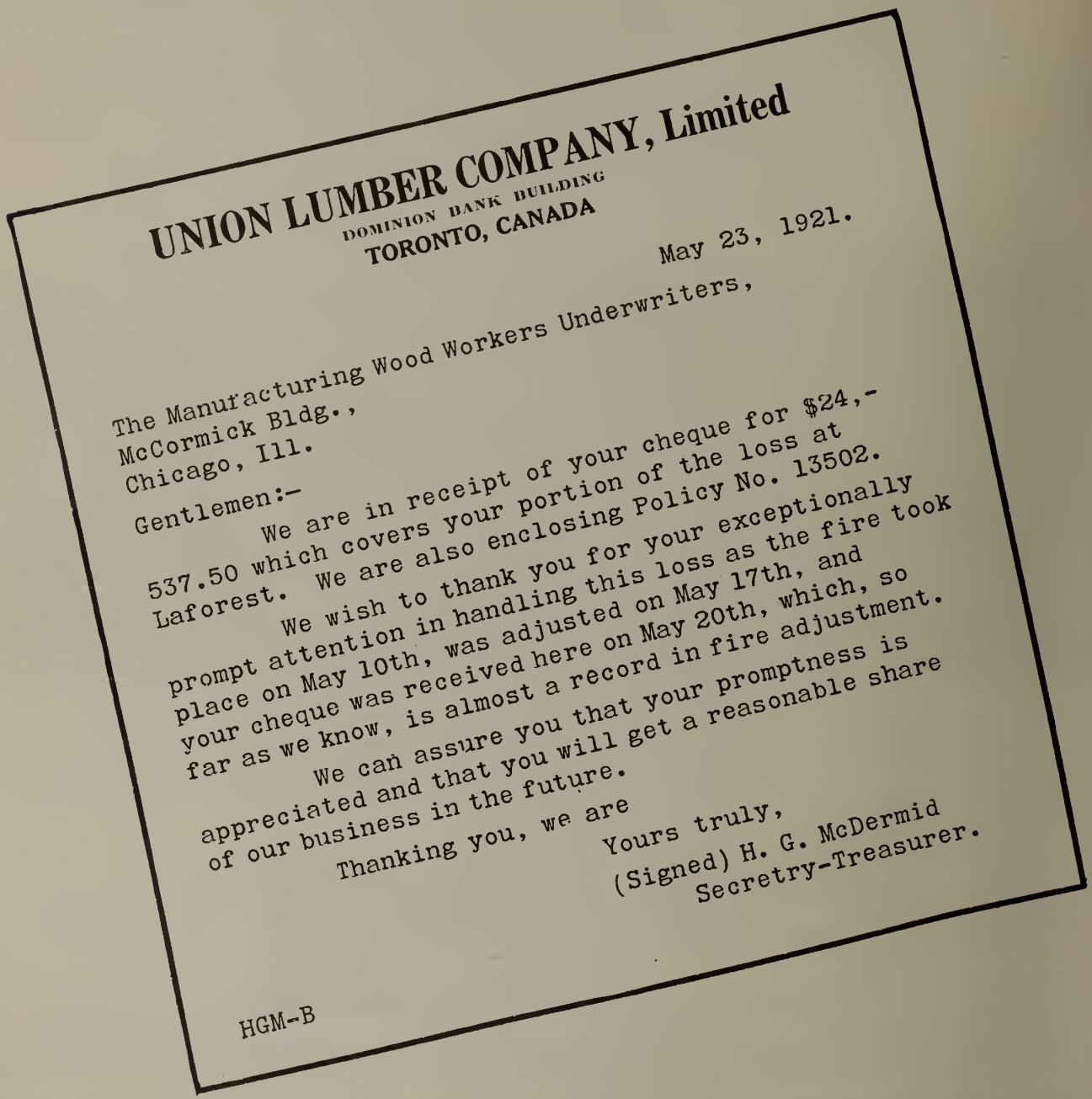
Can Anyone Think of an Argument to Beat This



UNION LUMBER COMPANY, Limited
DOMINION BANK BUILDING
TORONTO, CANADA

May 23, 1921.

The Manufacturing Wood Workers Underwriters,
McCormick Bldg.,
Chicago, Ill.

Gentlemen:-

We are in receipt of your cheque for $24,-
537.50 which covers your portion of the loss at
Laforest. We are also enclosing Policy No. 13502.

We wish to thank you for your exceptionally
prompt attention in handling this loss as the fire took
place on May 10th, was adjusted on May 17th, and
your cheque was received here on May 20th, which, so
far as we know, is almost a record in fire adjustment.

We can assure you that your promptness is
appreciated and that you will get a reasonable share
of our business in the future.

Thanking you, we are

Yours truly,
(Signed) H. G. McDermid
Secretry-Treasurer.

HGM-B

The above letter speaks for itself and, as usual, our check was the first received

We are not the largest fire insurance organization in the world, nor are we the oldest, but we have the strength of the strongest and our check is always first.

HERE IS OUR RECORD. In the past two years there have been sixteen heavy fire losses and with all the different forms of insurance mediums interested, in fourteen cases our check was first, the other two cases it was second.

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Date.....19

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11,000′	4/4	No. 2 C&B	30,000′	4/4	FAS
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BASSWOOD			60,000′	6/4	No. 1 Com.
75,000′	4/4	Sel. & Fas.	75,000′	6/4	No. 2 Com.
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75,000′	6/4	No. 1 Com. & FAS	150,000′	8/4	No. 1 Com.
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MAPLE			125,000′	10/4	No. 1 Com.
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4,700	"	3/4 x 3/12 Sap Gum No. 1 Com.
400	"	5/4 x 6 in. Plain red Gum Fas.
4,000	"	4/4 x 6 in. up Sap Gum No. 1 Com.
5,000	"	8/4 x 6 in. up Qt'd red Gum C. & B.
8,000	"	5/4 x 6 in. Plain White Oak Fas. ... ...
2,000	"	6/4 x 4 in. Plain White Oak No. 1 Com.
15,000	"	6/4 x 6 in. Plain red Oak Fas.
10,000	"	8/4 x 6 in. Plain red Oak Fas.
25,000	"	8/4 x 4 in. Plain red Oak No. 1 Com.
12,000	"	4/4 x 3 in. Tenn. Red Cedar No. 1 C. & B.
25,000	"	8/4 Sound Wormy Chestnut
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32,000	"	6/4 Sound Wormy Chestnut
5,000	"	4/4 Chestnut No. 1 C. & B.
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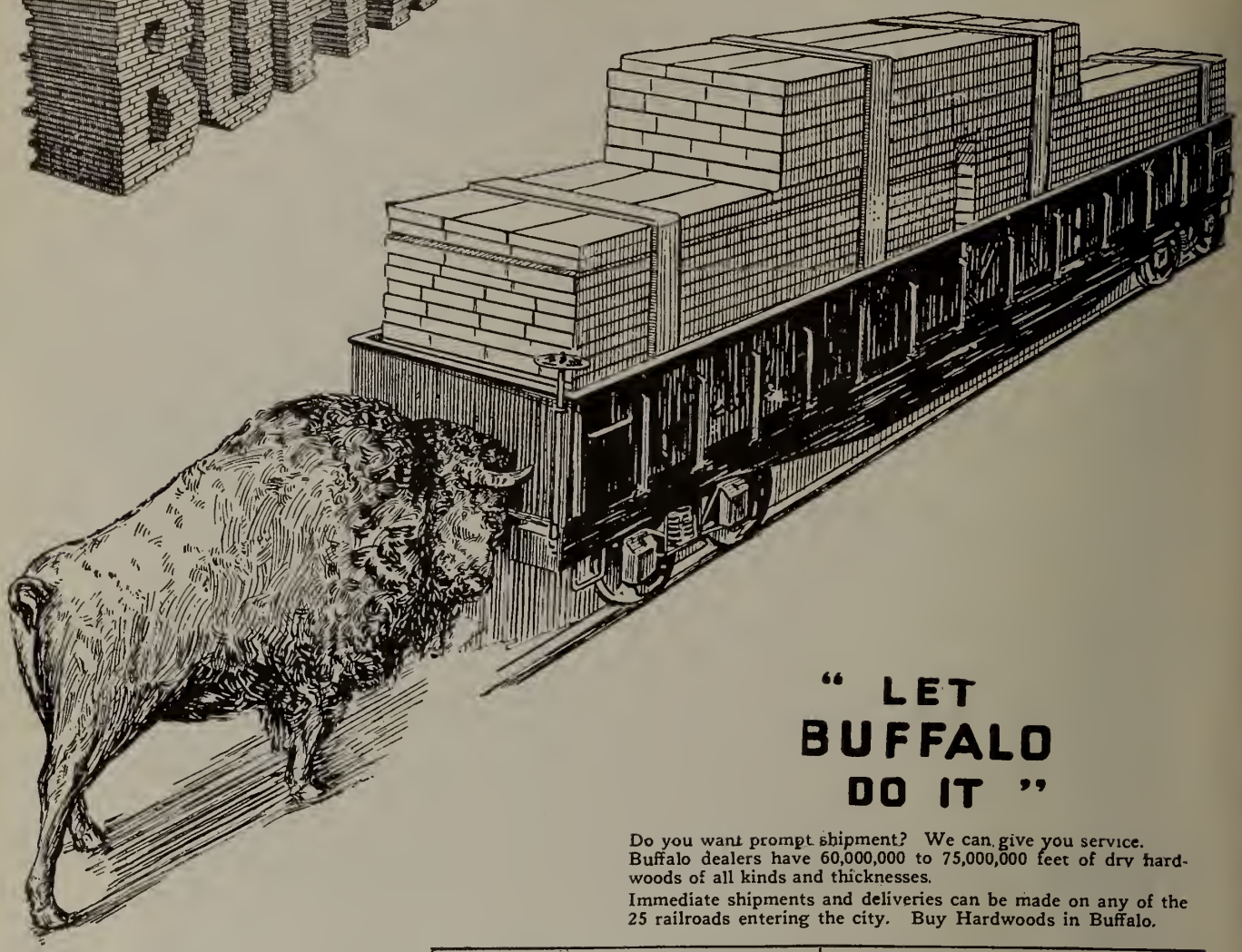

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A stock of 18,000,000 to 20,000,000 feet of hardwoods carried at all times at our two big Buffalo Yards
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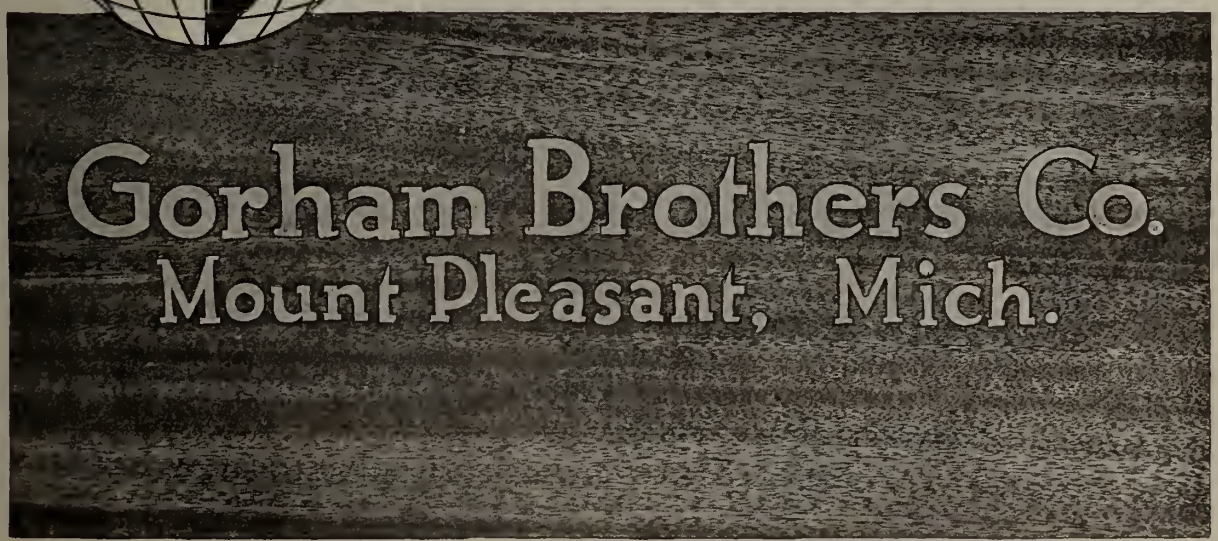
is well and favorably known in Canada as well as the States and its use in the form of Tops, Drawer Fronts, End Panels etc., in your product, will be a long step in securing the confidence of your customers which will result in orders and re-orders.

Our trademark is stamped on the back of every Top and Panel we make. Our guarantee that it is right and will stay right.



The Door Carrier System

Makes your dry-kiln doors steam-tight and saves time, heat, trouble and money.

Carrier lifts door clear of kiln and carries it down track. Returning, deposits door to rabbeted joint, where it is held steam-tight by its own weight. Applicable to old or new kilns.

Ask for catalogue.

DRY KILN DOOR CARRIER CO.
1117 Cornell Ave.
INDIANAPOLIS, IND.

William S. Whiting Company

JOHNSON CITY, TENNESSEE

1 Band Mill — *5 Circular Mills*

Hardwood Lumber

Oak	Basswood
Maple	Buckeye
Chestnut	Poplar
Ash	Birch

Rotary-Cut Soft Yellow Poplar Veneers
Quarter-Sawn White Oak Flitches
Sliced and Sawn Quartered White OakVeneers
Oak and Maple Flooring
Dowel Pins and Dowel Rods
Glued-Up Chestnut Cores and Dimension

5-16" Oak Parquetry Flooring Strips and Squares carried in stock at our warehouses:
138 44th St., Brooklyn, N.Y., and at Elizabethton, Tenn.

BLACK BROS. CLAMPS

Where Black Bros. Clamps are known, there is no second choice. Know them.

Carried in stock by leading dealers throughout Canada. Write for Bulletin, and name of nearest dealer.

The Black Bros. Co. - Mendota, Ill., U.S.A.

Peytona Lumber Co. Inc.

HUNTINGTON, W. VA.

BAND MILLS OMAR, CHRISTIAN LOGAN COUNTY, W. VA.

Band Sawed West Virginia Hardwoods

WHITE OAK	BASSWOOD
RED OAK	MAPLE
CHESTNUT	BEECH
POPLAR	HICKORY

Our own facilities for Surfacing, Resawing and Kiln Drying

Arkla Lumber & Mfg. Company

Main Office: - St. Louis, Mo.

Manufacturers and Wholesalers

Ash—Plain and Qtd. White and Red Oak Poplar, Cypress, Gum

In addition to stocks at Mill, we carry a well assorted dry stock of all items on our St. Louis yard available for immediate shipment. Write or wire us (our expense) for quotations.

F. HUNTINGTON SMITH
Canadian Representative

Mercerau-Hawkins Tie Company

Huntington - W. Va.

Manufacturers and Wholesale Dealers

West Virginia and Southern

HARDWOODS

We specialize in

Oak Tie Siding
White and Red Oak
Yellow Poplar
Basswood
Chestnut and
Gum Lumber.

Canadian Sales in Charge of

C. W. PETERS

Vice President and Manager of Lumber Dept.

RUSH LUMBER COMPANY

Manufacturers Southern Hardwoods

Band Mill and Office - Memphis, Tenn.

ASH
2 cars 5/4 No. 2 Com. & Btr.

CYPRESS
1 car 4/4 Shop & Btr.

ELM
3 cars 6/4 Log Run
1 car 8/4 Log Run
1 car 12/4 Log Run

PLAIN RED GUM
1 car 4/4 Com. & Btr.
1 car 5/4 Com. & Btr.
2 cars 4/4 No. 1 Common
2 cars 4/4 No. 2 Common

QTD. RED GUM
2 cars 4/4 No. 1 Common
1 car 6/4 F.A.S.
1 car 6/4 No. 1 Common
1 car 8/4 Com. & Btr.

QTD. RED GUM S.N.D.
2 cars 8/4 No. 1 & Btr.
1 car 10/4 No. 1 & Btr.
1 car 12/4 No. 1 & Btr.

PLAIN SAP GUM
1 car 4/4 F.A.S.
3 cars 4/4 No. 1 Com.
3 cars 4/4 No. 2 Com.
2 cars 4/4 No. 3 Com.
1 car 5/4 Com. & Btr.
2 cars 5/4 No. 2 Com.
1 car 5/4 No. 3 Com.

QTD. BLACK GUM
3 cars 4/4 No. 1 Com. & Btr.
1 car 4/4 No. 2 Com.

PLAIN BLACK GUM
1 car 4/4 Log Run

HICKORY
1 car 6/4 Log Run

QTD. WHITE OAK
2 cars 4/4 No. 1 & Btr.
3 cars 4/4 No. 1 Com.
1 car 4/4 No. 2 Com.
1 car 4/4 2½ to 5½ Cl. Strips
1 car 4/4 1¼ to 3 Com. Strips.
2 cars 5/4 No. 1 & Btr.
1 car - 6/4 No. 1 Com.

PLAIN WHITE OAK
3 cars 4/4 No. 1 Com.
1 car 4/4 No. 2 Com.
1 car 4/4 No. 1 Com. & Btr. Sound Wormy
1 car 5/4 No. 1 Com. & Btr.
1 car 5/4 No. 1 Com.
1 car 6/4 No. 1 Com.
1 car 5&6/4 No. 3 Com.

PLAIN RED OAK
3 cars 3/4 No. 1 Com. & Btr.
1 car 4/4 No. 1 Com. & Btr.
3 cars 4/4 No. 1 Com.
2 cars 4/4 No. 2 Com.
2 cars 5/4 No. 1 Com. & Btr.
1 car 5/4 No. 1 Com.
1 car 6/4 No. 1 Com. & Btr.

POPLAR
1 car 4/4 F.A.S.
1 car 4/4 Saps & Select
2 cars 4/4 No. 1 Com.
2 cars 4/4 No. 2 Com.
1 car of Dogboards.

Upham & Walsh Inc.

Throop St. South of 22nd St.

Chicago

Northern and Southern Hardwoods

We make a Specialty of

Oak, Gum, Elm, Maple Birch and Basswood.

We solicit your inquiries regarding lumber of any kind

Perkins Brothers

Kelso, Ark.

Manufacturers of

Southern Hardwoods

Quartered and Plain White Oak, Plain Red Oak, Gum Elm, Maple, Ash and Cypress

We are also prepared to cut dimension stock to order in Ash, Oak, Gum, Hickory and Elm.

Let us know your requirements.

L. D. LEACH & COMPANY

FISHER BUILDING, - CHICAGO, Ill.

Manufacturers Hardwood Lumber

6 Cars 4/4 No. 1 Common Red and White Oak
5 Cars 4/4 No. 2 Common Red and White Oak
4 Cars each 8/4 in. No. 1 and No. 2 Com. R. and W. Oak
2 Cars each 10/4 in. and 12/4 in No. 1 and No. 2 Common Red and White Oak

Oak Furniture — Vehicle and Car Stock Dimensions Sawed to Order

4/4 in. Gum—All Grades
4/4 in. Cypress—All Grades
4/4 in., 8/4 in. and 10/4 in. Log Run Soft Elm

Miller Lumber Company, Marianna, Arkansas, U. S. A.

Manufacturers of Southern Hardwoods

QUARTERED WHITE OAK

		Quantity
4/4	FAS	15,000
4/4	FAS	50,000
5/4	FAS	25,000
6/4	FAS	2,000
6/4	FAS	15,000
8/4	FAS	20,000
4/4	No. 1 Com.	400,000
5/4	No. 1 Com.	12,000
6/4	No. 1 Com.	4,000
6/4	No. 1 Com.	5,000
8/4	No. 1 and 2 Com.	6,000
4/4	No. 2 Com.	100,000

PLAIN WHITE OAK

4/4	FAS	18,000
4/4	FAS	40,000
5/4	FAS	10,500
8/4	FAS	5,000
4/4	No. 1 Com.	300,000
4/4	No. 1 Com.	200,000
5/4	No. 1 Com.	30,000
6/4	No. 1 Com.	40,000
8/4	No. 1 Com.	40,000
4/4	No. 2 Com.	250,000
4/4	No. 2 Com.	100,000
5/4	No. 2 Com.	8,500
6/4	No. 2 Com.	10,500
8/4	No. 2 Com.	15,000

QUARTERED RED OAK

4/4	No. 1 and 2 Com.	35,000
4/4	No. 1 and 2 Com.	50,000

PLAIN RED OAK

4/4	FAS	60,000
5/4	FAS	30,000
8/4	FAS	18,000
4/4	No. 1 Com.	500,000
4/4	No. 1 Com.	200,000
5/4	No. 1 Com.	33,000
6/4	No. 1 Com.	11,000
8/4	No. 1 Com.	32,000
4/4	No. 2 Com.	600,000
4/4	Sound Wormy	100,000
4/4	No. 3 Com.	500,000
5/4	No. 3 Com.	32,000
6/4	No. 3 Com.	15,000

MISCELLANEOUS OAK

4/4	3-5½" clr. Pl. Wh.O. Strips...	5,000
4/4	3-5½" clr. Pl. R.O. Strips.....	5,000
4/4	2-5½" clr. Qt. W.O. Strips SND	15,000
5/4	Pl. R.O. Step Plank, 11" & up.	11,000
8/4	R&W O. Bridge Plank	75,000
10/4	R&W O. Bridge Plank	15,000
12/4	R&W O. Bridge Plank	15,000

QUARTERED RED GUM

5/4	No. 1 C&Btr.	15,000
6/4	No. 1 C&Btr.	19,000
8/4	No. 1 C&Btr.	22,000
5/4	No. 1 Com.	13,000

PLAIN RED GUM

4/4	FAS	58,000
6/4	FAS	8,700
6/4	No. 1 Com.	3,700

SAP GUM

4/4	9-12" Bx. Bds.	63,000
4/4	9-12" Bx. Bds.	50,000
4/4	13-17" Bx. Bds.	56,000
4/4	18" & up Pan & W No. 1.....	4,200
4/4	6-12" FAS	50,000
4/4	13-17" FAS	40,000
4/4	13-17" FAS	50,000
5/4	No. 1 C. & Btr.	134,000
6/4	No. 1 C. & Btr.	83,000
4/4	No. 1 Com. Sap	200,000
4/4	No. 1 Com. Sap	200,000
5/4	No. 1 Com.	9,000
6/4	No. 1 Com.	5,000

TUPELO

4/4	6-12" FAS	21,000
4/4	13-17" FAS	4,600
4/4	9-12" Bx. Bds.	6,800
4/4	13-17" Bx. Bds.	2,300
4/4	No. 1 Com.	45,000

ASH

5/4	No. 1 C. & Btr.	1,300
8/4	No. 1 C. & Btr.	20,000
10/4	No. 1 C. & Btr.	15,000
12/4	No. 1 C. & Btr.	15,000

COTTONWOOD

4/4	FAS 6-12"	110,000
4/4	FAS 13-17"	27,000
4/4	18" & up Pan. & W. No. 1...	9,900
4/4	9-12" Bx. Bds.	32,000
4/4	13-17" Bx. Bds.	20,000
4/4	No. 1 Com.	100,000
4/4	No. 1 Com.	50,000
4/4	No. 2 Com.	100,000
4/4	No. 2 Com.	50,000

ELM

4/4	No. 1 C. & Btr.	69,000
6/4	No. 1 C. & Btr.	42,000
8/4	No. 1 C. & Btr.	15,000
10/4	No. 1 C. & Btr.	36,000
12/4	No. 1 C. & Btr.	32,000

MAPLE

4/4	Log Run	74,000
5/4	Log Run	62,000
6/4	Log Run	12,500
8/4	Log Run	100,000
8/4	Log Run	100,000

SYCAMORE

5/8"	No. 2 C. & B. Qtd.	30,000
4/4	No. 2 C. & B. Qtd.	138,000
4/4	No. 1 C. & B. Pl.	150,000
4/4	No. 1 C. & B. Pl.	150,000

CYPRESS

4/4	FAS	6,500
5/4	FAS	10,000
6/4	FAS	11,000
8/4	FAS	15,000

DRY HARDWOOD LUMBER

Anticipate a rise in prices by ordering **NOW.**
Will you let us quote on your requirements?

EDWARD CLARK & SONS LIMITED

807-9 BANK OF HAMILTON BUILDING - TORONTO, Ontario

SOUTHERN HARDWOODS

Dry Lumber in Buffalo for Quick Shipment

TENNESSEE SCENTED CEDAR

1"	74,000 ft.
1¼"	5,000 ft.

CHERRY

	1 & 2	No. 1 Com.	No. 2 Com.	No. 3 Com.
1"	112,500	176,900	45,500	58,000
1¼"	5,900	33,600	12,500	26,900
1½"	3,000	47,700	36,300	38,000
2"	8,000	22,200	64,900	9,500
2½"	6,500	3,300	2,200	.....
3"	25,700	4,500	3,300	.....
4"	5,900	.....	400	.....

CHESTNUT

	1 & 2	Clear Strips	No. 1 Com.	S.W. & No. 2 Com.
¾"	1,000	.....	51,000	103,000
1"	36,000	1,000	17,000	89,000
1¼"	151,000	300	80,200	199,200
1½"	77,500	.....	42,000	.....
2"	16,200	.....	17,300	116,200
2½"	4,000	.....	1,500	500
3"	2,100	.....	1,300	500
4"	1,500	.....	.....	.....

QUARTERED WHITE OAK

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
½"	6,500	.....	.....	.....
¾"	400	300	23,600	9,000
5/8"	2,800	.....	5,500	800
1"	40,300	20,000	49,400	27,000
1¼"	10,000	.....	5,000	.....
1½"	600	.....	2,400	.....
2"	.....	.....	25,100	5,700
2½"	2,000	.....	.....	.....

PLAIN WHITE OAK

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
⅜"	1,000	.....	.....	.....
½"	100	.....	.....	.....
5/8"	9,150	.....	1,000	16,900
¾"	227,800	.....	360,000	112,000
1"	39,300	1,700	86,000	85,200
1¼"	14,300	.....	1,100	5,000
1½"	97,300	.....	66,000	18,000
2"	62,000	.....	117,000	65,000
2½"	164,800	.....	56,500	3,000
3"	77,800	.....	65,800	14,400
3½"	5,500	.....	3,000	1,500
4"	76,000	.....	27,500	6,000

PLAIN RED OAK

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
⅜"	24,200	.....	.....	.....
¾"	204,000	.....	340,000	68,800
5/8"	4,000	.....	77,000	42,600
1"	48,200	3,150	46,000	126,400
1¼"	39,700	2,400	4,600	300
1½"	168,900	4,300	40,200	40,000
2"	110,500	.....	144,000	77,000
2½"	78,100	.....	21,000	3,700
3"	28,800	.....	20,500	7,000
4"	18,600	.....	8,900	.....

QUARTERED RED OAK

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
¾"	1,700	.....	9,700	500
1"	21,200	5,400	2,500	1,400
1¼"	2,000	.....	.....	.....
2"	.....	.....	7,400	.....

SAP GUM

	1 & 2	No. 1 Com.	No. 2 Com.	No. 3 Com.
1"	16,000	6,000	200	2,100
1¼"	.....	400	.....	12,000
1½"	2,400	6,000	13,500	2,500
2"	.....	5,700	10,400	25,800

QUARTERED SAP GUM

	1 & 2	No. 1 Com.	No. 2 Com.
4/4	.....	2,500	12,000
5/4	14,000	.....	.....
8/4	22,000	8,000	200
10/4	10,250	23,000	1,800

PLAIN RED GUM

	1 & 2	No. 1 Com.	No. 2 Com.
1"	29,300	10,000	11,500
1¼"	12,000	11,325	.....
1½"	15,000	17,300	9,500
2"	11,000	2,000	5,500

QUARTERED RED GUM

	1 & 2	No. 1 Com.	No. 2 Com.
4/4	6,000	12,000	7,000
5/4	13,400	7,800	.....
6/4	9,900	3,500	.....
8/4	22,100	22,500	3,600

POPLAR

	1 & 2	Bright Saps	No. 1 Com.	No. 2 Com.
5/8"	18,000	20,800	31,300	800
1"	41,000	9,200	111,900	78,800
1¼"	24,300	3,700	5,700	19,000
1½"	19,100	13,000	43,000	4,500
2"	.....	.....	12,500	24,500

Also Large Stocks of Ash, Basswood, Beech, Birch, Hard and Soft Maple.

THE ATLANTIC LUMBER CO., 310 Manning Chambers, Toronto

MANUFACTURERS SOUTHERN HARDWOOD LUMBER

Yards: BUFFALO, N.Y. Mills: KNOXVILLE, TENN.; FONDE, KENTUCKY

The London Lumber Co. Ltd.

WHOLESALE LUMBER

Will make attractive prices for 4/4 Birch and Elm; immediate shipment. Also have good stock in all thicknesses, Soft & Hard Maple, Ash, and Basswood. Write us for quotations.

487½ Richmond St. London, Ont.

The Bacon Lumber Co.

HARDWOODS:

OHIO and INDIANA
KENTUCKY and WEST VIRGINIA
NORTHERN BIRCH and MAPLE
SOUTHERN GUM, COTTONWOOD

306 Ulmer Bldg., Cleveland, Ohio

Sawed Veneer

Quartered White Oak
For Furniture and Panels

Plain Red Oak
For Interior Trim and Doors

Cypress
For Battery Separators

Manufacturing Uniformly Good.
Quality Unsurpassed

James E. Stark & Co., Inc.
MEMPHIS, TENN.

BEDNA YOUNG Lumber Company

Jackson - Tennessee

Manufacturers of

Quartered White Oak
Quartered Red Oak
and Other Hardwoods

When in the market for

High Grade Lumber

please let us have your enquiries.

Sales Office: 610 Lombard Bldg.
Indianapolis, Indiana

Since Colonial Days

Oak Floors have been the standard in representative American homes.

Oak Flooring is recognized — almost by second nature — as the *best* flooring material for homes of every type and size.

In public and semi-public buildings, apartments, hotels and offices it is the logical *first choice.*

Bruce OAK FLOORING THE BEST *Oak Flooring*

has definitely established its super-excellence in homes and buildings from Coast to Coast.

In addition to its intrinsic worth, Bruce Oak Flooring affords the trade a merchandising service seldom equaled in precision and convenience. *Dealers can always get it.*

Square edge parquetry strips, Oak trim, mouldings and hardwood lumber in the same car with Oak Flooring if desired. Prices and particulars on request.

E.L.BRUCE COMPANY

MANUFACTURERS
MEMPHIS, TENN.
Flooring Plant: LITTLE ROCK
Band Mill: LITTLE ROCK

MEMPHIS BRUCE LITTLE ROCK

We specialize in Birch, Basswood, Hard Maple

A High Standard of Quality and Service

500M	4-4	Unselected	Birch	500 M	4-4	Basswood		500M	4-4	Hard Maple	
300M	5-4	"	"	300M	5-4	"		400	5-4	"	
150	6-4	"	"	200	6-4	"		400	6-4	"	
125	8-4	"	"	75	8-4	"		600	8-4	"	
150	10-4	"	"					400	10-4	"	
150	12-4	"	"					300	12-4	"	
75	14-4	"	"					75	14-4	"	
75	16-4	"	"					100	16-4	"	

Sawyer Goodman Company

Marinette - Wisconsin

WE ARE TELLING THE PUBLIC: "BE SURE YOUR WALNUT IS ALL WALNUT"

AMERICAN WALNUT

WE ARE TELLING THE PUBLIC: "BE SURE YOUR WALNUT IS ALL WALNUT"

"The Cabinet-wood Superlative."

RISING TIDE FOR AMERICAN WALNUT

The steadily rising tide of public interest and public faith in genuine American Walnut furniture has developed to the point where buyers are insisting that *their WALNUT be ALL WALNUT.*

Furniture manufacturers will profit by this sales barometer and plan their production of American Walnut furniture accordingly.

It is a very practical assurance of quick moving stock and satisfied customers.

Our National campaign of advertising is featuring this slogan—

"BE SURE YOUR WALNUT IS ALL WALNUT"

AMERICAN WALNUT MANUFACTURERS' ASSOCIATION

ROOM 1019 616 SOUTH MICHIGAN BOULEVARD CHICAGO

Reese Sheriff Lumber Co.

WILLIAMSPORT, PENNSYLVANIA

Manufacturers of

Northern and Southern Hardwoods
White Pine, Spruce and Hemlock

With special attention to **Oak, Chestnut, Poplar, Cherry, Walnut, Gum and Basswood.**

OUR MOTTO

REASONABLE PRICES—that you can afford to pay.
EFFICIENT SERVICE — that you have a right to expect
FAIR TREATMENT — that you can depend on getting

We would appreciate an opportunity of furnishing a portion of your lumber requirements.

BY MAKING TEST RUNS OF YOUR LUMBER

You will find that our stock will reduce your costs to a minimum and improve the quality of your product. Indiana hardwoods cost no more than the other kinds—then why not use them ?

We are the largest hardwood producers in Indiana and give below a partial list of stock on hand:

INDIANA QUARTERED WHITE OAK

	1s & 2s	No. 1 Com.	No. 2 Com.
1/2″	1 car	1 car	
5/8″	2 “	4 “	
3/4″	1 “	5 “	1 car
4/4″	3 “	4 “	4 “
5/4″	1 “	3 “	1 “
6/4″	1 “	3 “	
8/4″	1 “	2 “	

Also Clear and No. 1 Common Quartered White Oak Strips.

INDIANA QUARTERED RED OAK

	1s & 2s 6″ & up	1s & 2s 9″ & up	No. 1 Com.	No. 2 Com.
1/2″—3500′				
5/8″—1 car			1 car	
4/4″—3 car		1 car	3 “	1 car
5/4″—2 “		1 “	2 “	
6/4″—2 “		2500′	1 “	
7/4″—1 “		4500′		
8/4″—2000′		3000′	1 “	

PLAIN WHITE OAK

	1s & 2s	No. 1 Com.	No. 2 Com.
5/8″	1 car	1 car	
3/4″		4000′	
4/4″	2 “	4 cars	2 cars
5/4″	1 “	3 “	1 “
6/4″	1 “	2 “	
8/4″	3 “	2 “	
2½″	½ “	1 “	

PLAIN RED OAK

	1s & 2s	No. 1 Com.	No. 2 Com.
5/8″	2 cars	2 cars	
3/4″		5000′	
4/4″	4 “	4 cars	3 cars
5/4″	1 “	3 “	
6/4″	1 “	4 “	
8/4″	2 “	3 “	
2½″	2 “	3 “	

BLACK WALNUT—Steamed Stock

	1s & 2s	No. 1 Com.	No. 2 Com.
4/4″	1 car	3 cars	12000′
5/4″	1 “	1 “	9000′
6/4″	4000′	4000′	
8/4″	1 car	1 car	

1 car 5/8″ Log Run, not steamed.

WE ARE IN POSITION TO KILN DRY THIS LUMBER. ASK FOR OUR RATES.

We also have good stocks of Poplar, Ash, Beech, Hickory, Maple, Gum, Tupelo, etc.—Write us for prices.

Maley & Wertz Lumber Company

EVANSVILLE, INDIANA

MILLS AT EVANSVILLE, IND., GRAMMER, IND., and KEIRNS, MISS.

Dimension Stock you can depend on

One of the largest and best equipped Dimension Plants in the South offers you its facilities. Situated in the heart of the Blue Ridge Hardwood district. Capacity 1,500,000 Feet per Month.

CORE STOCK, Clear Flat Stock and Mouldings from Chestnut, Oak, Poplar, Basswood, Cypress or Tupelo Gum

Large Stock of Dry Lumber.
Perfect Kiln Drying.
Guaranteed Mill Work.

Won't you let us do for you what we have done for our own Northern Factories?

National Casket Co.
DIMENSION DEPARTMENT
Asheville, North Carolina

Stimson Veneer and Lumber Co.

(Inc.)

Office and Mill: McLean Ave. and Union Belt R.R.

Memphis - Tenn.

We sell only the product of our own mills and make band sawn lumber in all Southern Hardwoods.

We specialize in Quartered White Oak, Red Oak, and Red Gum.

With allied companies we make fifty million feet annually.

J. V. Stimson Hardwood Co.

Manufacturers and Exporters

Band Mills: Memphis, Tenn., Helena, Ark.

Memphis - Tenn.

STOCK LIST

QUARTERED WHITE OAK
- 3 cars 4/4" 1s and 2s.
- 5 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common .

QUARTERED RED OAK
- 5 cars 4/4" 1s and 2s.
- 10 cars 4/4" No. 1 Common.
- 4 cars 4/4" No. 2 Common.
- 2 cars 6/4" No. 1 Common and Better.

QUARTERED RED GUM
- 10 cars 4/4" 1s and 2s.
- 3 cars 4/4" 1s and 2s Fig.
- 2 cars 5/4" 1s and 2s.
- 2 cars 6/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 2 cars 5/4" No. 1 Common.
- 2 cars 6/4" No. 1 Common.

QUARTERED RED GUM, Sap no Defect
- 5 cars 6/4" No. 1 Common and Better.
- 10 cars 8/4" No. 1 Common and Better.

ASH
- 4 cars 10/4" No. 1 Common and Better.
- 1 car 12/4" No. 1 Common and Better.
- 1 car 6/4" No. 1 Common and Better.
- 2 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common.

SAP GUM
- 10 cars 4/4" 1s and 2s.
- 20 cars 4/4" No. 1 Common.
- 10 cars 4/4" No. 2 Common.
- 2 cars 4/4" 18" up Panel.
- 5 cars 4/4" 13-17" Box Boards.

PLAIN RED OAK
- 2 cars 4/4" 1s and 2s.
- 2 cars 6/4" No. 1 Common and Better.
- 2 cars 10/4" No. 1 Common and Better.

PLAIN WHITE OAK
- 4 cars 4/4" No. 1 Common Plain.

COTTONWOOD
- 2 cars 4/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 5 cars 4/4" No. 2 Common.

ELM
- 2 cars 4/4" Log Run.
- 10 cars 10/4" Log Run.
- 10 cars 12/4" Log Run.

MAPLE
- 4 cars 12/4" Log Run.

Dowels, Turnings, Knobs, Spindles, Buttons, Drawer Stops, Table Pins, Screwhole Plugs. Special Woodwork to order.

No 2 Dowel Pin

HENRY ROWE MFG. COMPANY NEWAYGO, Mich.

DRY STOCK

For Immediate Shipment

	SOFT ELM	
6905′	1″	—No. 1 C&B
3195′	1″	—No. 2 Com.
41030′	1½″	—No. 1 C&B
2356′	1½″	—No. 2 Com.
56880′	2″	—No. 1 C&B
10046′	2″	—No. 2 Com.
110594′	2½″	—No. 1 C&B
26985′	2½″	—No. 2 Com.
11750′	3″	—No. 2 Com.
	WHITE ASH	
87846′	2″	—No. 1 C&B
3072′	2″	—No. 2 Com.
139960′	2½″	—No. 1 C&B
13537′	2½″	—No. 2 Com.
18992′	3″	—No. 1 C&B
608′	3″	—No. 2 Com.
	HICKORY	
650′	1″	—No. 1 C&B
1408′	2″	—No. 1 C&B
	COTTONWOOD	
1620′	1″	—No. 1 C&B
19956′	2″	—No. 1 C&B
1196′	2″	—No. 2 Com.
	BLACK WALNUT	
2873′	1″	—No. 1 C&B
1151′	1″	—No. 2 Com.
	WILLOW	
1446′	1″	—No. 1 C&B
	CHERRY	
4747′	1″	—No. 1 C&B
2137′	1″	—No. 2 Com.
	ROCK ELM	
12493′	2″	—No. 1 C&B
	SOFT MAPLE	
14397′	2½″	—No. 1 C&B
	BASSWOOD	
1549′	1″	—No. 1 C&B
606′	2″	—No. 1 C&B
	BUTTERNUT	
2584′	1″	—No. 1 C&B
	HARD MAPLE	
31788′	1″	—No. 1 C&B
243927′	1¼″	—No. 1 C&B
227707′	1½″	—No. 1 C&B
1796′	1½″	—No. 2 Com.
217401′	2″	—No. 1 C&B
11410′	2″	—No. 2 Com.
38016′	2½″	—No. 1 C&B
11091′	3″	—No. 1 C&B
2796′	4″	—No. 1 C&B
	BEECH	
3000′	1½″	—No. 2 Com.
500′	2″	—Log run
250′	2½″	—Log run
350′	3″	—Log Run
100′	4″	—Log run
	BIRCH	
15998′	1″	—No. 1 C&B
22311′	1¼″	—No. 1 C&B
11748′	1½″	—No. 1 C&B
50157′	2″	—No. 1 C&B
87172′	2½″	—No. 1 C&B
7866′	3″	—No. 1 C&B
	PLAIN OAK	
9869′	1″	—No. 1 C&B
1107′	2″	—No. 1 C&B

The above stock is in our Battlecreek yard and we are so located that we can load and ship stock immediately upon receipt of your orders. We guarantee National Hardwood Lumber Association grades.

PAYSON SMITH LUMBER CO.

Plymouth Building - MINNEAPOLIS, Minn.

McLEAN MAHOGANY & CEDAR CO., INC.

American Hardwoods

WE SOLICIT YOUR ENQUIRIES

742 Ellicott Square, Buffalo, N.Y.

OAK

Plain and Quartered

Uniform Color—Soft Texture

Poplar, Ash

and other

Hardwoods

We carry 35,000,000 feet dry stock—all of our own manu facture.

Oak Timbers and Planking

The Mowbray & Robinson Co.

(INCORPORATED)

Manufacturers

Office: CINCINNATI, OHIO

MILLS

Quicksand, Ky.; West Irvine, Ky.

Canadian Representative :

A. K. Johuson, Traders Bank Building, Toronto, Ont

E. SONDHEIMER CO.

MEMPHIS, TENN., U.S.A.

Band Mills at
Baton Rouge, La., Sondheimer, La., Tallulah, La.
Office & Distributing Yard, Memphis, Tenn.

Manufacturers of Southern Hardwoods — Dry Stock Ready for Shipment

Ask us for prices. We may be able to save you some money. We specialize in genuine Tensas Basin Red Gum—best in the world.

WHITE ASH
1 car each 1", 1¼", 1½" 1s&2s
2 " 2" 1s & 2s
7 " 1" No. 1 Com. & Sel.
3 " 1¼" No. 1 Com. & Sel.
1 " 1½" No. 1 Com. & Sel.
3 " 2" No. 1 Com. & Sel.
1 " each 2½" & 3" ditto
5 " 1" No. 2 Common
2 " 2" No. 2 Common
1 " 2½, 3½, 4" No. 2 Cm.

COTTONWOOD
5 " 1" 1s&2s
1 " 1½" 1s&2s
10 " 1" No. 1 Common
5 " 1¼" No. 1 Common
5 " 1½" No. 1 Common
3 " 1" No. 2 Common
4 " 1¼" No. 2 Common
10 " 1½" No. 2 Common
2 " 1x 9 to 12" Box Bds.
2 " 1x13 to 17" Box Bds.

CYPRESS
1 " 1" Shop
2 " 1" No. 1 Common
1 " each 1x 4, 1x 8", No. 1 Com.
1 " each 1x10, 1x12", No. 1 Com.
1 " 1" Pecky

SOFT ELM
2 " 1½" Log Run
5 " 2" Log Run

PLAIN SAP GUM
10 " each 1" & 1¼" 1s&2s
15 " 4/4" No. 1 Common
2 " 5/4" No. 1 Common
15 " 4/4" No. 2 Common
10 " 5/4" No. 2 Common
5 " 4/4" No. 3 Common

BLACK GUM
1 " 1" Log Run

PECAN
3 " 6/4" Log Run
4 " 8/4" Log Run

MAGNOLIA
2 " 1" No. 2 Common
1 " 1" No. 2 Common

QRTD. RED GUM
5 " 1" 1s&2s
3 " 1¼" 1s&2s
2 " 2" 1s&2s
1 " each 2½ & 3" 1s&2s
8 " 1" No. 1 Common
3 " each 1¼ & 2" No. 1 C.

QRTD. RED GUM
(Sap No Defect)
10 " 1" 1s&2s
1 " 1½" 1s&2s
3 " 2" 1s&2s
5 " 1" No. 1 Common
3 " each 1¼ & 2 "No. 1 C.

QRTD. WHITE OAK
3 " 1" No. 1 Common
1 " 1" No. 2 Common

QRTD. RED OAK
3 " 1" 1s&2s
5 " 1" No. 1 Common
2 " 1" No. 2 Common

PLAIN WHITE OAK
1 " 3/4" 1s&2s
1 " 3/4" No. 1 Common
6 " 4/4" No. 1 Common
5 " 4/4" No. 2 Common

PLAIN RED OAK
2 " each 1" & 1¼" 1s&2s
15 " 1" No. 1 Com. & Sel.
1 " 1¼" No. 1 Com. & Sel.
10 " 1" No. 2 Common
1 " 1¼" No. 2 Common
5 " 1" Sound Wormy
8 " 1" No. 3 Common

QRTD. TUPELO
1" 1s&2s

PLAIN-SAWN TUPELO
6 " 1" 1s&2s
10 " 1" No. 1 Common
5 " 1" No. 2 Common
1 " 1" No. 3 Common
1 " 1x13 to 17" Box Bds.

WILLOW
8 " 1" 1s&2s
5 " 1¼"1s&2s
1 " each 1½ & 2" 1s&2s
15 " 1" No. 1 Common
8 " 1¼" No. 1 Common
1 " 1½" No. 1 Common
10 " 1" No. 2 Common
8 " 1¼" No. 2 Common
10 " 1½" No. 2 Common
5 " 2" No. 2 Common
1 " 1x13 to 17" Box Bds.

Lumber
Walnut, Mahogany Plain and Quartered Oak, Ash, Cherry

Veneers
Walnut and Mahogany

WE specialize in AMERICAN BLACK WALNUT and can furnish straight cars from 3/8 to 4 inches in thickness. Also can load mixed cars WALNUT and MAHOGANY LUMBER and VENEERS, PLAIN and QUARTERED RED and WHITE OAK, ASH and HERRY.

The Kosse, Shoe and Schleyer Co.

Eastern Branch:
BALTIMORE, Md.

Main Office and Band Mill:
CINCINNATI, Ohio

30 Million Feet Hardwoods Yearly

Manufactured by

Darnell-Love Lumber Co.

Leland, Mississippi

We own and operate two large band mills with sufficient timber to supply these mills, at present capacity, fifteen to twenty years

Cutting

Oak, Ash, Gum, Elm

Cypress, Cottonwood

and various other Native Woods

Our Specialties are—

3/8", 1/2", 5/8" and 3/4" in Gum and Oak

and

8/4" Quartered Red Gum

8/4" Quartered Red Gum Sap No Defect

WE SOLICIT YOUR INQUIRIES AND ORDERS

Thompson-Katz Lumber Co.

Manufacturers of

WHITE ASH EXCLUSIVELY

In dealing with us the wood worker and furniture manufacturer may rightly expect a better service, better value and a greater selection from which to choose his requirements. We have all grades and all thicknesses to offer—beautiful stock that we know will please you. Drop us a card to-day—we'll do the rest.

MEMPHIS, TENNESSEE

J. H. Bonner & Sons

Memphis, Tenn.

Mills:

Jonquil and Ruffwood, Ark.

Manufacturers

Band Sawn Hardwood Lumber

Write or wire for prices on

Gum, Oak, Elm, Etc.

Frank Purcell Walnut Lumber Co.

Plenty of logs like the portion of our stock shown above have made possible the million and a half foot stock of well manufactured American Walnut Lumber which we now have to offer.

Prompt shipment

All grades and thicknesses

Guaranteed Inspection

12th AND BELT LINE

Kansas City - Kansas

QUALITY FIRST

SOFT TEXTURED OAK
SALINE RED and SAP GUM

MANUFACTURE AND QUALITY:—

Soft Textured Alabama Plain and Quartered White Oak, Arkansas Spanish Red Oak, Saline River Bottom Red and Sap Gum, Arkansas Cottonwood and Hickory. Manufactured by mill units that manufacture it right, well edged and trimmed, wonderful widths, at least 50% on all cars guaranteed of 14 and 16′ lengths.

SERVICE:—

Can wire car number on order in forty-eight hours after receipt of order from customer. SEE BEFORE YOU BUY, samples on all kinds of stock with Canadian Representative to enable the Purchasing Agent to get the class of material he wants.

Memphis Land & Lumber Co.

8th Floor, Central Bank Bldg. MEMPHIS, TENN.

Canadian Representative:
WILLIAM BARRATT,
413 Crawford St., Toronto, Ont.

Nichols & Cox Lumber Co.

GRAND RAPIDS - MICHIGAN

We can ship promptly the following items. Can also kiln dry if desired.

2 cars	4/4	1st and 2nd	Sap Gum
5 "	4/4	No. 1 Com.	"
3 "	5/4	No. 1 Com. and Better	"
2 "	6/4	"	"
2 "	8/4	"	"
4 "	6/4	"	Qtd Sap Gum
5 "	8/4	"	"
3 "	0/4	"	"
2 "	12/4	"	"
2 "	4/4	"	Plain Red Gum
1 "	5/4	"	"
1 "	6/4	"	"
1 "	8/4	"	"
2 "	4/4	1st and 2nd	Plain Red Oak
3 "	4/4	No. 1 Com.	"
1 "	5/4	No. 1 C & B	"
1 "	6/4	"	"
1 "	8/4	"	"
1 "	4/4	1st and 2nd	Plain White Oak
2 "	4/4	No. 1 Com.	"
2 "	10/4	No. 1 Com. and Better	Birch
1 "	12/4	"	"
1 "	10/4	"	Basswood
5 "	6/4	No. 2 Com. and Better	Gray Elm
5 "	4/4 to 8/4	No. 1 Com. and Better End Dried	White Maple

Send us your enquiries for anything needed in Northern and Southern Hardwoods.

DIMENSION

My Specialty is

Dimension Lumber

For Manufacturers of

Wagons and Implements, Buggies and Autos, Furniture, Railroad Car and Track Material

Standard Sizes on Hand for Prompt Shipment. Special Sizes Cut to Order

SOUTHERN HARDWOOD LUMBER

C. B. COLBORN

438 Randolph Building

MEMPHIS - TENN.

A name that should be on your inquiry list for Hardwood Lumber

American Column & Lumber Co.

Brunson Building, COLUMBUS, OHIO

—Manufacturers of—

West Virginia

Soft Yellow Poplar
Plain White Oak
Plain Red Oak
Quartered White Oak
White Oak Timbers and Plank

Chestnut	Butternut
Basswood	Ash
Maple	Cherry
Hickory	Walnut
Beech	Sycamore
Buckeye	Black Gum
Birch	Hemlock

Oak and Hardwood Dimension Stock

Steele & Hibbard Lumber Co.

ST. LOUIS, MO.

56 Years in Business

We carry a large stock of dry

Hardwood Lumber

25 Different Kinds
Quick Shipment
Write or wire for Prices

We specialize Oak cut from Mild Texture Missouri Timber with thin sap both plain and quarter sawed.

We ship also from Sawmills direct; Red as well as Sap Gum and Poplar both plain and quarter sawed, Sound Wormy Chestnut, Cypress and Ash.

"Wire collect for prices or other information. Time is Money, delays pay no dividend."

St. Francis Basin Hardwoods

Kraetzer Cured and Air Dried

Tennessee Aromatic Red Cedar

Carloads and less or mixed with Hardwoods

"What Others Say"

"Your letter of February 15th received and we want to say that this was a very nice lot of lumber. It was good widths and lengths and well manufactured, dry stock and the grading was very liberal. We are sorry we cannot use more of this lumber at the present time. *We received several cars from other manufacturers at a cheaper price but the lumber was not nearly as satisfactory.* When we are in need of more stock we will take the matter up with you."

(Note—The above was sent us February 24, 1921 unsolicited. Name given on application).

GEO. C. BROWN & COMPANY

Home Office - MEMPHIS, TENN.

BAND MILLS, PROCTOR, ARK. CROOKED BAYOU, ARK.

The Talge Mahogany Co.

INDIANAPOLIS

Offers you the most exclusive line of
Foreign and Domestic Veeners and Lumber

We specialize in
Mahogany, Walnut and Oak

No Order too Small—No Order too Large

Yellow Poplar Lumber Co.

Manufacturers of Band Sawed

Poplar Plain Oak
Quartered Oak
Chestnut Basswood

Capacity 50,000,000 per annum

SPECIALTY: Monogram Brand Oak Flooring

CANADIAN ENQUIRIES SOLICITED

COAL GROVE, OHIO, U. S. A.

Tennessee Lumber & Coal Company

Manufacturers and Wholesalers

APPALACHIAN HARDWOODS

Soft Textured White and Red Oak, Poplar, Chestnut, Southern Gum

OAK TIMBERS AND PLANKING CUT TO ORDER

Band Mills: Verdun, Tenn., Louvain, Tenn. **Submit your enquiries to our Sales office, Cincinnati, Ohio.**

"Hartzell's Choice Walnut"

The way Walnut comes to us

COMING AND GOING

One constant stream of American Black Walnut from "Stump to Consumer" flowing through a steady, reliable and satisfactory channel.

"Geo. W. Hartzell"

Logs in the rough coming in Veneers and Lumber of the highest quality going out daily year in and year out covering a period of 35 years.

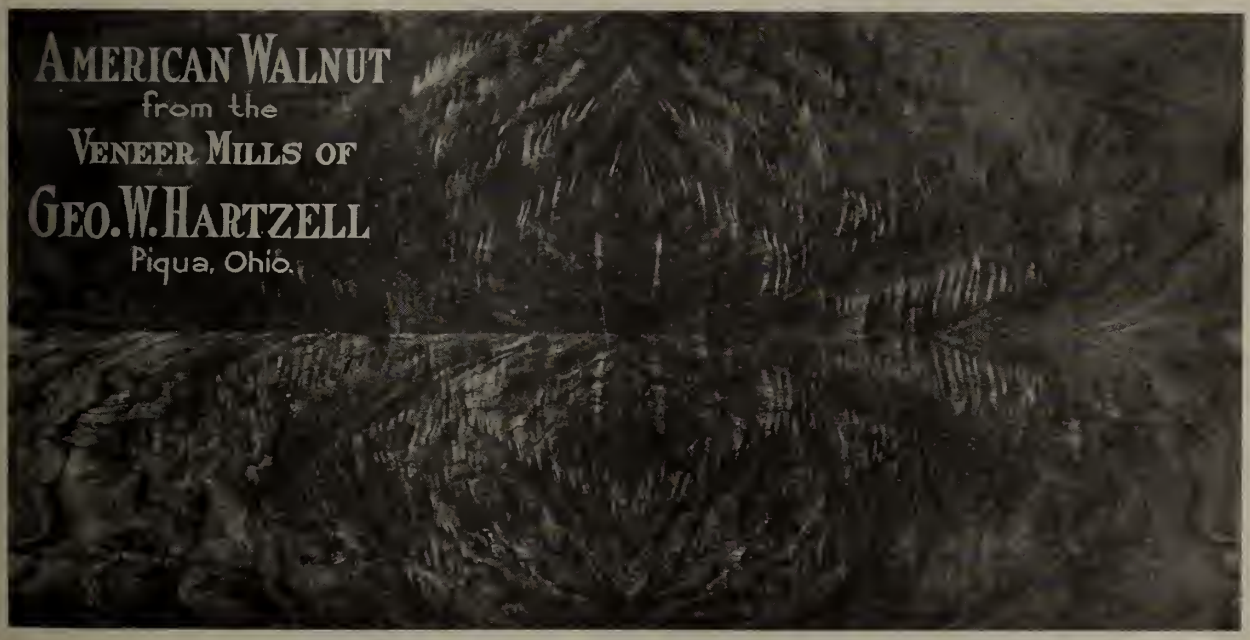
We rightfully claim your patronage because of "SERVICE and QUALITY," if there is any question in your mind about it

"Try Us and We Will Ship You the Convincer"

No Order too large, no Order too small to receive the close and careful attention it is our custom to give. That is a great part of our business, serving our customers.

"WRITE FOR SAMPLES AND QUOTATIONS"

Geo. W. Hartzell - Piqua, Ohio



The way it goes to our Customers

Highest Quality

St. Francis Basin Hardwoods

Band Sawmill - Marmaduke, Ark.

SAH
OAK
GUM
CYPRESS
TUPELO
SOFT MAPLE

The Vail Cooperage Co.

General Office - FORT WAYNE, Ind.

OUR EXPORT BRAND

Service LHC *Quality*

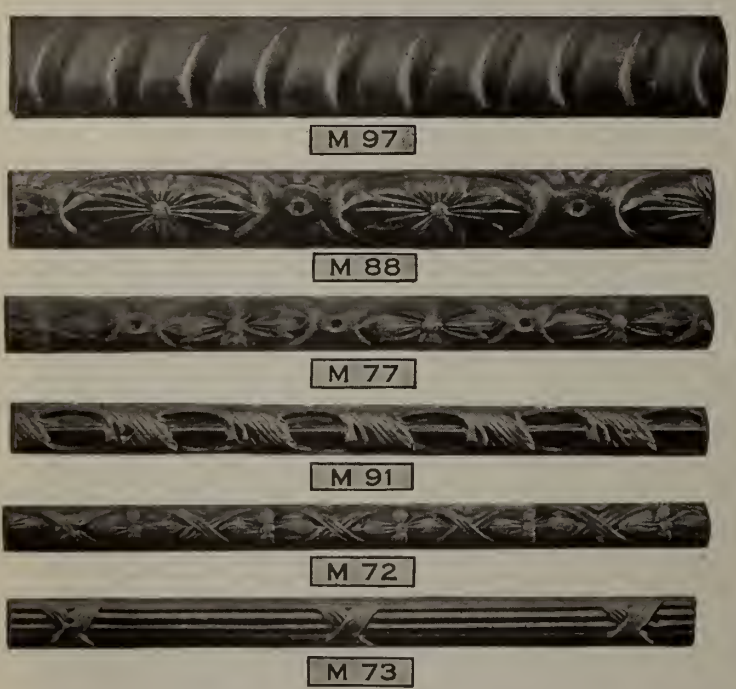
Prompt
SPECIAL
Plain White Oak
50 M' 1" FAS
30 M' 1¼" FAS
12 M' 1½" FAS
15 M' 2" FAS

Shipments
SPECIAL
Plain White Oak
70 M' 1" No.1 C&S
20 M' 1¼" No.1 C&S
20 M' 1½" No.1 C&S
15 M' 2" No.1 C&S

GUM
ASH
OAK
POPLAR
CHESTNUT

LIVERPOOL HARDWOOD COMPANY Inc.

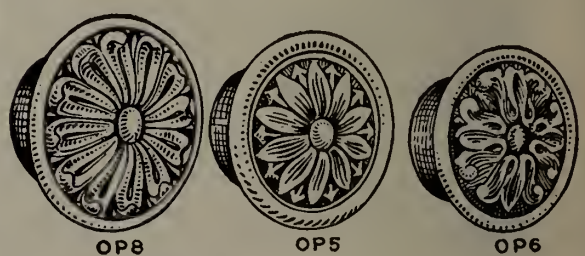
50 Church St. NEW YORK CITY
Bank of Commerce Bldg. MEMPHIS, TENN.



MOULDINGS We are making more Period Mouldings than ever before. Orders should be placed early to assure your supply when needed.

KNOBS The Period Knobs we placed on the market a few months ago are proving very popular. If you have not received samples ask for them now.

ROSETTES A new Period item to accompany the knobs.



Waddell Manufacturing Company

Coldbrook and Taylor, N. W. Grand Rapids, Mich.

Announcement :—

Special Offerings

in

Mahogany and Walnut Veneer

Word from you will bring samples and prices

Mahogany Lumber* - *Every grade and thickness on sticks in our yards

Lewis Thompson & Co. Inc.

Colonial Trust Bldg. **Philadelphia, Pa.**

From Tree to Consumer

For nearly thirty years the Chapman and Dewey Lumber Company has cut the timber from its own hardwood lands in the famous St. Francis delta region of Arkansas, sawn it in its own mills and sold the lumber through its own offices. From the cutting of the trees until the last board is loaded on the cars this company handles its entire product. The result is low cost of operation and economy in selling —distinct savings which the customers of this company enjoy. When you buy from Chapman-Dewey you buy direct from the tree.

This Company can offer at this time some exceptional quotations on Hardwoods for a great variety of manufacturing purposes. Wire our expense for quotations.

CHAPMAN AND DEWEY LUMBER CO.

Kansas City, Mo. Marked Tree, Ark.

OAK, ASH, RED GUM
SAP GUM, SYCAMORE

MAPLE, ELM
CYPRESS, COTTONWOOD

High Grade White Hickory

Why Pay High Freights on Waste Material? Stock sawed free and clear of defects to specified sizes. Waste eliminated at source. Operating numerous Mills throughout the choicest HARDWOOD BELTS in the United States.

"Buttcutt" Brand

Hickory, Oak and Ash

DIMENSION STOCK

Ski Billets, Picking Sticks, Hockey Sticks, Coupling Rods, Handle Blanks, Furniture Stock, Dowel Blanks, Rim Strips, Spoke Blanks, Shaft and Pole Stock, Gear Woods, Vehicles and Motor Woods for Bending Purposes.

Brown Brothers Company
MANUFACTURERS
11 Broadway - New York

The BRAND of QUALITY

Bigelow HARDWOOD PRODUCTS

The SYMBOL of SERVICE

A Complete Stock of Assorted Grades and Thicknesses

NORTHERN HARDWOODS

ASH, BEECH, BIRCH, BASSWOOD
SOFT ELM, ROCK ELM, HARD MAPLE

THE BIGELOW-COOPER CO.

BAY CITY - - MICHIGAN

WAYNE LUMBER CO.

Manufacturers and Wholesalers

Canadian Hardwoods

- - BIRCH AND MAPLE

OUR SPECIALTY

Elm, Ash, Basswood, Beech, Chestnut, Oak, and Poplar

110 West 40th St. New York

Canadian Representative,
D. Cote, 730A Champagneur, Outremont, Montreal

Band Sawn West Virginia Hardwoods

Our timber, of virgin growth in Greenbrier and Pocahontas Counties, limestone soil, gives a combination of Texture, Quality and Character that is most desirable to the Woodworking trade.

The most critical Hardwood users are among our best accounts. Why?

The W. C. Barlett Lumber Co.
Charleston, W. Va.

A "Quality" you will admire
A "Service" you will appreciate

We have the facilities for giving Canadian Woodworkers and Furniture Manufacturers a prompt service on straight or mixed cars of the following:

Ash, Oak, Gum, Poplar, Hickory, Walnut, Chestnut, Beech, Maple, Elm, Sycamore, Cottonwood.

Soft textured Plain and finely figured Quarter-Sawn Red and White Oak our specialty .

J. V. Stimson & Company
OWENSBORO - KENTUCKY
Bandmills : Owensboro; Campbellsville, Kentucky

D. E. Hewit Lumber Co.

Huntington, W. Va.

MANUFACTURERS

West Virginia Hardwoods

(Not Better than the Best but as Good as the Best)

FAS Plain White and Red Oak
No. 1 Com. Plain White and Red Oak
Implement Oak
Sound Wormy Chestnut
No. 1 Common and Better Chestnut
Hickory Plank
Poplar and Basswood

Burns & Knapp Lumber Co.

Manufacturers of

Southern Hardwoods

Plain White and Red Oak, Dimension Oak, Hickory, Ash, Chestnut, Poplar, Basswood, Walnut, Maple, Beech, Butternut.

CONNEAUTVILLE, PA.

We list below, items of our own manufacture, band sawn, that we are in a position to ship promptly.

1/2", 5/8, 3/4, 4/4, 5/4, 6/4 & 8/4 Quartered White Oak

3/4, 4/4, 5/4 & 6/4 Qtd. Red Oak

5/8, 3/4, 4/4, 5/4, 6/4 & 8/4 Plain Oak

4/4, 5/4, 6/4, & 8/4 Sound Wormy Oak

5/8, 4/4, 5/4 & 6/4 Plain Sap Gum

4, 5, 6, 8, 10 & 12/4 Qtd. Sap Gum

4, 5 & 6/4 Plain Red Gum.

4, 5, 6, 8, 10 & 12/4 Qtd. Red Gum

4, 5, 6 & 8/4 Tupelo Gum.

5/8, 4, 5, 10 & 12/4 Ash.

5/8, 4, 5, 6, 8, 10 & 12/4 Elm.

5/8, 10 & 12/4 Maple.

4, 5 & 6/4 Cottonwood.

MAY BROTHERS Office and Band Mills: MEMPHIS, TENNESSEE

UP FROM THE TROPICS SUPREME AMONG WOODS

MAHOGANY

Tabasco, Laguna, Honduras and Mexican Mahogany

Out from the tropical interior, along steaming jungle paths and down long rivers to the sea, the history of OTIS mahogany can be traced. Virgin forests yield their treasures to the enterprising white man and natives do his bidding as he seeks and hews the timber so valued in the north land. Thus mahogany in quantities to satisfy the largest buyer comes to our yards. Twelve million feet per year is our capacity, and assures you of prompt service. Write for our prices to-day.

ESTABLISHED 1867 OTIS TRADE MARK **INCORPORATED 1886**

Otis Manufacturing Company

Peters Avenue and The River

NEW ORLEANS, LA.

Chicago Office: Room 208, 128 N. Wells Street

PERIOD CARVINGS

for

FURNITURE

Largest Manufacturers of Imitation Wood Carvings in the World

Quality the Best — Prompt Shipment

Unlimited facilities for the manufacturing of high grade period wood carvings in composition and wood fibre. Reproductions of exclusive designs our specialty.

CATALOGUE SENT ON REQUEST

THE DECORATORS SUPPLY COMPANY

ARCHER, LEO AND LIME STREETS

CHICAGO

QUALITY

THE highest quality in Southern Hardwoods best identifies the products of the Memphis Band Mill Co.
If you are in the market for Oak, Red and Sap Gum, Poplar, or any other Southern Hardwood, you can be assured of the choicest stock on the market if you place an order with us.

Memphis Band Mill Co.
"Quarter-Sawn White Oak Headquarters"
Memphis, Tenn. - U. S. A.

Efficiency Marks Every Step of Our Service to You

Exact photograph of alley in our yard

White and Red Oak

Plain & Quarter Sawed Red Gum

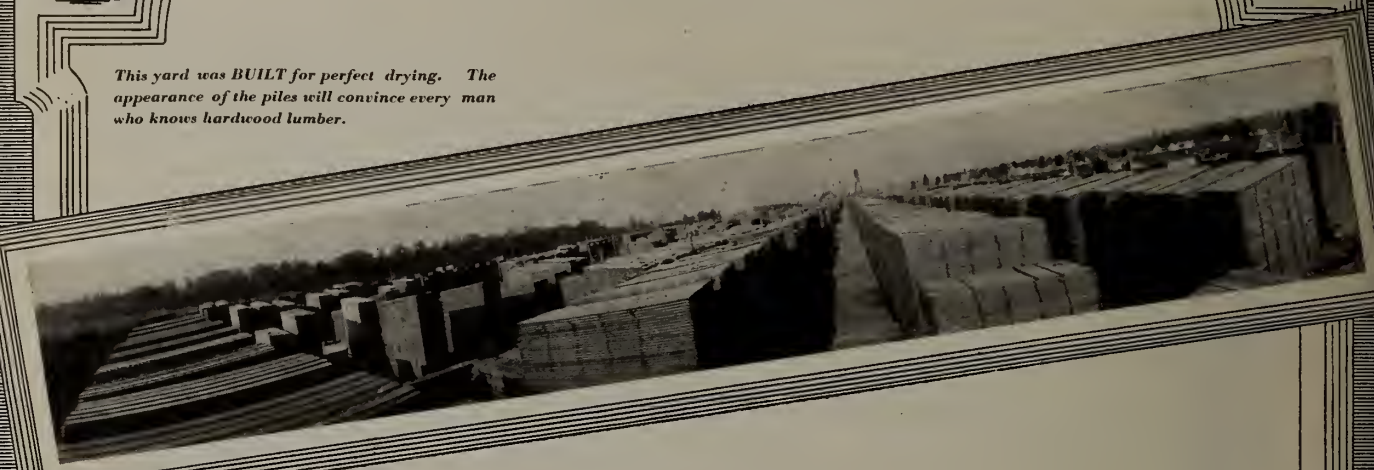
Our Specialty Quarter Sawed Red Gum in Plain and Figured Wood

From the cutting to the delivery to your hands, our entire stock receives the most careful attention. All the excellence of quality and the beauty of the wood is kept just as it is when cut. When next you are in need of Oak, Ash, Elm, and Cypress of first class quality and in perfect condition write us. We can ship promptly.

BARR-HOLADAY LUMBER CO.

BAND MILL AT LOUISE, MISS. GREENFIELD, OHIO

WIS



This yard was BUILT for perfect drying. The appearance of the piles will convince every man who knows hardwood lumber.

Lumber Can't Be ALWAYS Good Without Perfect Piling

The *correct* drying of hardwood lumber is a science based on definite formulae. Recognizing this, our yard was *built* to insure the most perfect possible drying.

Everyone familiar with lumber will recognize what the appearance of the piles in the accompanying photograph means. They are your guarantee of flat, straight, clean lumber.

Our list includes the standard species and grades of southern hardwoods with NOTHING PICKED OUT, and has behind it a comprehensive and conscientious desire to give the customer his full measure of value and service,

Wisconsin Lumber Company
Chicago, Illinois
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Prior to 1860 complete cargos had sailed from Africa, but the holds were laden with human freights from which was manufactured the great American Civil war.

From the valuable cargo aboard the "Corinth" was produced the beautiful and the useful—a contribution to the prosperity and civilization of America.

To the successful venture of this pioneer ship is largely due the position and influence of African Mahogany in the wood artistry of today.

It is immaterial that the Mengel Company were the operators of this ship and the owners of this cargo.

THE MENGEL COMPANY
INCORPORATED
LOUISVILLE, KY.

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What About Standardization?

Standardization, as applied to mouldings and all forms of interior woodwork and also standard window and door openings, has been discussed from time to time in the " Canadian Woodworker."

The benefits and advantages to be derived from the adoption of uniform sizes and designs by the millwork industry are so numerous that it is difficult to understand why some definite move has not been made, having this end in view. True, there are those who oppose and pooh-pooh such a suggestion, but when brought down to brass tacks, it is usually found that their antagonism is founded upon fear and selfishness—they are afraid that standardization would enable others to compete with them in what they like to consider their own territory. On the face of it, it would appear that objections based on a fear of competition, are an admission of weakness, as they would seem to indicate a conviction that other plants are able to manufacture and sell similar products for less money.

If that is the strongest argument that can be brought forward against the standardization of millwork, the sooner such a step is taken by the industry the better. With a uniformity of output, competition would, undoubtedly, be keener, but is that a thing to be feared? Lack of competition tends for inefficiency and high prices, so that if faced with increased opposition, the operator of each individual plant must give greater attention to its equipment and the methods followed, and must also make all changes and improvements necessary to enable him to compete, on at least an equal basis, with the best of the outside manufacturers. Again, service would become more than a mere word ,to be spoken lightly. It would become a reality, for in the long run it would be the plant best prepared to give service that would be able to successfully meet and overcome all outside competition.

The operator of a large plant in the Grand Rapids, Michigan, district decided not to wait concerted action on the part of a number of woodworkers, but to standardize his own line. He made a canvass of his territory and then went back through records covering the material sold during the past few years. This enabled him to determine the sizes of doors, windows, sash, etc., that were in strongest demand. The sizes and designs of mouldings, trim and other woodwork were checked up in the same way. From this information he was able to adopt patterns and sizes that seemed particularly suitable for the requirements of his trade. The result was that he was able to reduce his stock without impairing the selection, for he still carried a complete line of standardized doors, sash, frames, mouldings, etc. He found that by eliminating non-essentials and lines for which there was little demand, he was able to reduce prices slightly and increase the volume of business done.

When asked as to whether or not he found standardization profitable, he replied:—" Yesterday afternoon about 4 o'clock we sold the finished doors and windows for three houses, with the understanding that we were to deliver them, complete, the next day. The only reason we got this order was that because a competitor could not make delivery of the jobs complete, and we could. There is no question in my mind but that there is a saving of from 10 to 25 per cent. to be made in the building of the ordinary home by using this standardization method."

There will always be a demand for special work of various kinds. This business could be handled either by a separate department in each plant devoted entirely to detail work, or by certain plants which might cater solely to the demand for special or non-standardized lines.

For the woodworker catering to the general building trade, standardization offers numerous advantages. Naturally, concerted action by the whole industry would be best, but from the illustration cited, it would appear as if each individual would be able, through standardization, to reduce his stock, give better service, increase his sales, stimulate the demand for building material, and make more money.

In considering this question, the advantages to be derived from the use of standardized dimension stock should not be overlooked. Immense savings can be effected in freight, reduction of waste, and lowered manufacturing costs by as much raw material as possible, in the form of dimension. Were such a practice to become general, it would result in a greater utilization of our forest wealth. The prediction has been made that the time is not far distant when huge plants will be established at the larger lumbering centres to cut dimension and partly manufactured stock for furniture, sash, door, and other similar plants.

What the Furniture Exhibitions Taught

New Lines and Low Values Bring the Business—Buyers Demand Full Money's Worth —Public Must be Aroused from Lethargy by Attractiveness of New Designs.

Results of the furniture exhibitions held in Grand Rapids, Chicago, Evansville, and other American furniture producing centres, would seem to indicate that, below the line, conditions in the furniture field are rapidly returning to normal. By " normal " is not meant the large volume of business which prevailed during the boom periods of 1919 and 1920, but rather to the average amount of business done during the years preceding that period.

Of all the exhibitions held, that of Grand Rapids was, probably, the most satisfactory. The attendance about equalled the high record established during the July market of 1919, while the volume of orders placed cannot be considered anything else but satisfactory. In some respects the buying might be termed " spotty," for certain manufacturers secured sufficient business to keep their plants running at capacity for the remainder of 1921, while others were not so fortunate.

New Designs and Attractive Prices

Design and price are given as the reasons for this variation. Some of the more far-sighted and aggressive manufacturers brought out entire new lines and offered them at compaartively low prices. This must not be taken to mean that the prices were below cost of production, but rather that costs were figured at rock bottom, based on present replacement values, and that profits were cut to a minimum, expecting to make their money on the large volume of business which they hoped to secure. Other manufacturers, the unfortunate ones who did not fare so well, merely offered their old lines at prices which the buyer did not consider to be sufficiently low.

The attitude of the retail buyers in attendance was to shop around, compare values, and place their orders where they considered they got the most for their money. Their contention was that they could sell only furniture that was new and, perhaps, startling in design, and which was quoted at bargain prices. The consensus of opinion of the manufacturers was that the prices asked represented values as low as they ever will be, and that the next move will probably be higher.

Styles Show Greater Originality

Those who brought out new designs seem to have departed somewhat from the period furniture which has been in such strong demand during recent years. Many of the pieces shown lean toward the old Colonial, only much more simplified and less massive. What really has happened is that the American designers have taken their motifs from such old masters as Chippendale, Hellplewhite, Adam, and others, and have added so much of their own thought and individuality to their designs, that the resultant product cannot be termed a reproduction of any of the older periods. It is expected that if this tendency develops, before many years the design of the product of certain plants will be known by the name of the designer or of the manufacturer.

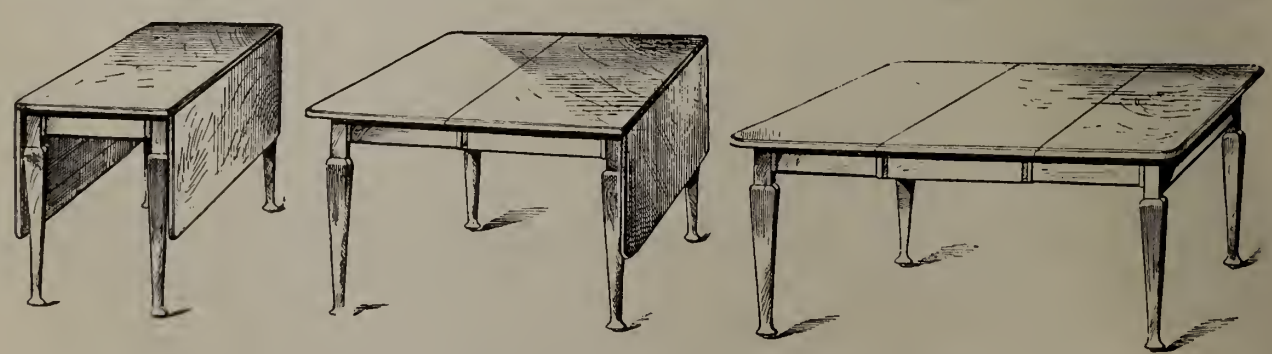
Oak Gaining in Popularity

Furniture in Italian design was to be found in abundance, but even these took on new form and new shape. The polychrome finish was used to an extent never before witnessed, and massive, sombre pieces of Italian furniture were to be found brightened and decorated by bright, glaring colors applied in a harmonious, attractive manner. Painted furniture was also conspicuous in most displays. Some of this was decorated with hand-painted decorations in a very attractive manner.

Probably one of the most interesting developments noted was the increased use of oak. This would seem to indicate that this attractive wood is once more coming into popular favor. Of course, the old Golden Oak finish, with its sharply contrasted markings, has gone, its place being taken by some of the newer finishes in softer hues and tones. Another departure in the use of oak was where manufacturers of high-class mahogany and walnut suites are using quartered oak for their drawers and interiors. By making the interiors so attractive, they have added much to the value and salability of their lines.

All the above might also be said of the Chicago market, with the exception that, if anything, it was more spotty. The present market has often been termed a " buyers' market," and the results of these exhibitions would seem to indicate that this is true. Those manufacturers who went out of their way to give to the dealer what he wanted in design, quality, and price, were amply repaid for the expense and trouble involved, while others who thought they could knock a little off the price and get away with it, were sadly disillusioned.

In addition to the orders booked during the exhi-



New type of extension table recently placed on the British market.

bitions, the furniture men were of the opinion that the August road sales would show a very gratifying increase. If their expectations should be fulfilled, it would be due partly to the confidence and goodwill created at these exhibitions, and partly to the fact that many of the retail dealers intend holding August clearance sales, in an endeavor to clean out the balance of high-priced stock which is on their floors.

Trend of Upholstery Design

Among the displays of upholstered furniture made at the exhibition held in Grand Rapids recently a distinct change was noted in the style and design. The pieces shown were more distinctive and more elegant than the older designs, and more of the frame was in sight. It would seem as if there is an effort being made to get away from the bulky appearance of the stuff-over furniture, and without detracting from the comfort which must be embodied in such pieces to produce a more attractive and artistic article. This was shown in the thin arms with lighter upholstering found on many of the suites. On the whole, the design of the frames was more along period lines, both with regard to the stretcher work and the upper parts. Some of the pieces had a decidedly frail appearance, but were solidly built in such woods as mahogany, walnut, oak, and gum. Th range shown included all the better-known periods covering English and French designs, also including furniture of the Italian Renaissance style. It has been predicted that another season will see a stronger leaning toward the French style of furniture.

Many of the lines on display were covered in brown sateen, with the seat made up of one long cushion rather than three, as has been common of late. The idea of using this covering was to enable the purchaser to choose a covering which would harmonize with the draperies and decorations of the room in which the piece is to be placed.

Some of the upholstered furniture was very elaborate in design, consisting of elegant davenport suites in polychromed Italian Renaissance style. In coverings, the velours and tapestry are still in common use, although greater care was taken in the selection of the coverings shown.

Trained Engineers are a Vital Necessity

High Speed Production the Ideal—Reduction of Waste a Big Problem—Poorly Designed Shavings Exhaust System Expensive Installation—More Practical Information Required

By Sern Madsen, Curtis Companies, Inc., Clinton, Iowa.

The field for the engineer in the woodworking industry has fast been developing in the last two decades. The small isolated shop is giving way to the larger, more efficient factory. Only in larger specialized factories can woodworking really be put on a high-speed, production basis. Only where a large quantity of like parts can be produced will it pay to develop highly specialized machines. In no other industry, perhaps, is the product more diversified than in the average small woodworking plant. Generally, but few pieces are machined alike. This, more than anything else, has retarded the use of specialized machinery in woodworking plants. In the sawmills, this condition has not prevailed, and the result has been a very efficient arrangement of machinery, conveyors, etc.

Reducing Waste Bill

We are just in the midst of a tremendous change in woodworking development. The problems presented to the engineer cover a very broad field, so that there is enough variety to make the work fascinating. Aside from lumber drying and machine design, the engineer comes squarely up against the problems of waste utilization, power development, electrical equipment, dust collecting systems, heating and ventilating, safety devices, factory and machine maintenance, material handling, and many others. It is doubtful is any other industry will offer a mechanical engineer better opportunity for service and at the same time such a diversified list of activities. At some time or other, he will find need for every little bit of knowledge that has been tucked quietly away somewhere in his gray matter ever since he left college.

In order to better illustrate the scope and importance of some of the above-mentioned problems, let us briefly consider a few of them.

Utilization of waste is one of our large problems. Gradually we are cutting lumber closer to the knots and using a little more cross-grained material. This requires better cutter heads. There are always a lot of edgings. These are used for mouldings, dowels, lath, etc., but even yet too much of this finds its way to the boiler furnaces. There are thousands of board feet wasted in cutting out knots and trimming off boards to length, but the big problem is to find a way to use these smaller scraps. Generally, these scraps are too cross-grained to use for matches, toothpicks, or other small articles. Perhaps some day they can be used for making pulp or fibre board. It may be possible to distill from the knots such useful products as turpentine, tar, and the like. Along these lines the possibilities are unlimited, and it remains for someone to step in and turn the trick.

A modern plant usually produces nearly enough chips, shavings, and sawdust to supply its entire needs of fuel for heating and power purposes. Lacking a better way of disposing of this refuse, it is at present fortunate that it has even this important use. Ordinarily, woodworking power plants operate non-condensing, for the simple reason that during about seven months of the year the exhaust steam is all needed for heating purposes, and for dry kiln purposes it is needed the year round. It is true we have a surplus of exhaust steam during the summer months, but also at that time we have an abundance of shavings and sawdust which must be disposed of. If we operated condensing in the summer time, we would have to dispose of shavings and sawdust in other ways. The market for these has not yet become great enough to pay for their transportation.

In this whole scheme it can be seen that there are possibilities of large savings.

Economical Burning of Refuse

The problem of burning shavings economically has not yet been solved in nine-tenths of the woodworking plants. Many plants spent thousands of dollars in coal bills that might be saved by the adoption of better firing methods in the boiler room. The firing of shavings is very much like using powdered coal. The essential sof economical combustion depend upon constant automatically controlled feeding of fuel and perfect control of air supply properly distributed through the grate surface. Apparatus for attaining these ends still needs to be installed in 95 per cent. of the woodworking power plants. Waste due to poor combustion and other bad boiler room conditions will average between 20 and 30 per cent.

The constant attention of a competent engineer is needed to maintain economical operation of the boiler and engine room equipment. The modern plant will distribute its power electrically, and for this, 3-phase 60-cycle 220-volt current seems to be the most popular. Wastage of electrical power needs to be constantly watched. It may be safely stated that the average plant wastes from 20 to 30 per cent. of the power delivered at the switchboard.- Certainly here is a field of endeavor for the most ambitious mechanical engineer.

A Prodigious Power Waster

Dust and shavings collecting systems serve a double purpose. They keep the air free of dust for the operators of machines, and at the same time transport the dust and shavings to the boiler house. An efficient system is indispensable to the success of a woodworking plant. Engineering data on dust collecting systems is not very generally distributed, but an enormous amount is available to the one who desires it. Perhaps no other equally important equipment is so little understood, and surely no other equipment has so great possibilities in wasting or saving power. A high-powered system may be practically useless, while an economical system may be highly efficient. It is absolutely unfair to expect anyone but an experienced engineer to make a thorough job of a blow-pipe system. It is simply appalling to think of the power that is wasted every hour of the day and every day of the year on inefficient blow-pipe systems that have been installed by incompetents. The fact that the power required to drive a fan increases as the cube of the speed, is an unknown rule as far as the average woodworking plant is concerned. In many systems it is possible to save from 25 to 50 per cent. of the power now used to drive exhauster fans if the installation were correct. It is little short of criminal the way a large share of our blow-pipe systems are installed. When the mill owner wakes up to this fact, he will seek the services of an engineer who understands the work.

Many interesting possibilities present themselves in motor applications. Wherever they are direct connected motors, speeds need to be considered. We have thus far been limited to certain fixed speeds of the polyphase induction motor. An entirely new field of possibilities has been opened up by the recent placing on the market of frequency changers. Ordinary 60-cycle current gives us no speeds between 1200-1800 and 3600 R.P.M. We have need for speeds of approximately 1500, 2400, and 4500, or higher. Perhaps some day these speeds will all be available by the use of 75-85 cycle current in addition to the present 60 cycle.

Authoritative Information Lacking

In almost every other industry we have an abundance of magazine and books which deal with its mechanical equipment. It is true that we have some very progressive magazines covering the woodworking industry, but good books are decidedly lacking. The Civil Engineer has his "Trantwine," the Architect his "Kidder," the Electrician his "Foster," the Mechanic his "Kent" or "Marks," and the Machinist his Machinery Handbook, but the woodworker still has no authoritative handbook. Our public schools have fairly good courses in Manual Training, but these fall short of actually training the industrial woodworker. We have elementary texts and elementary methods of teaching, but what we need are thorough, comprehensive, and authoritative sources of education in woodworking.

At present a mechanical engineering course comes to the nearest in preparing one for dealing with woodworking methods and equipment, but his four years' college training are as a primer compared with the things he has to learn after entering the shop. There is a tremendous need for the trained technical man in the woodworking industries, but for the present he will have to be largely trained on the job. In all industries this is largely true, but in no case is it so apparent as in woodworking. He must be a self-seeker after knowledge, for as yet no college or university offers him a complete course in this ancient and important art.

It is not enough that technical knowledge and help is available to the woodworking industry. It is absolutely essential that more technical men must be empolyed to be on the job all the time. The industry must avail itself of every chance for improvement, and at the present time there is no surer way than to engage the services of the engineer. It is up to the woodworking industry to take the best trained men available and train them further. It must not expect too much of these men until they have graduated from a full course in the modern woodworking shop. It will require a very earnest co-operation between the woodworker and the engineer to achieve the goal which this ancient but re-born industry deserves.

BOILER EFFICIENCY.

The boiler room should not be the abode of dust and grime as is so often the ease, but should be regarded just like any other part of the works, and should be kept correspondingly elean. The walls should be whitewashed frequently, so as to make the plaee light and pleasant to work in, and the floor should be swept daily. Coal dust and cinders should be eleared up at least once a day and not be scattered about the floor for months.

Not only should the place look respeetable, but the routine work should be redueed to a system so that it is done in an orderly manner and with less fatigue than is often the ease.

Attention to the boiler gauge is essential in order that the firemen may know exactly the pressure of the steam at any moment. The gauge should be plaeed where it ean be seen readily in the daytime, and at night should be illuminated.

Make Your Office Advertise Your Business

Attractively Finished Office Adds to Prestige and Creates a Demand for High Class Woodwork—What More Progressive Woodworkers are Doing—Display Product to Arouse Interest and Increase Sales.

We all have our opinion of business men or business organizations which are not progressive, which do not try to improve their methods or their product, which are living in the past rather than in the present, working for the future, which are content to sit back waiting the pleasure of the gods rather than assuming the aggressive, attempting to stimulate business and becoming a power and an authority in the community in which they labor. Your opinion is, probably, the same as the writer's. We are all more or less affected, because this class is all too prevalent in the woodworking industry. There are some woodworkers who seemingly have been in a rut for years, and who should be given a jolt that would arouse them from the state of complacency into which they have fallen and cause them to give heed to the trend and development of the times. One earmark of this type of woodworker is an untidy, unattractive, ill-kept, poorly-finished office.

What is an office, anyway? What is it for? Is it merely a place in which the accounts are handled and the various transactions and details of the business recorded, or is it the place in which the customers and other callers are received, business transacted, and sales made? If the former, almost any kind of a place will do, as its location and equipment are unimportant. If the latter, it is the very physiognomy and heart of the whole organization, and should be treated accordingly.

Judged by Appearances

Would you deal with a tailor who habitually value the advice or opinion of a shoeman who dressed in ugly, ill-fitting garments, or would you clothed his feet in shabby, down-at-the-heel shoes? What must be the opinion of the prospective purchaser of fine woodwork, who upon entering the office of the local authority on things pertaining to this line, finds himself in a dusty, dingy, poorly-kept office, a place in which fine woodwork, as represented by attractive interior trim and fine furniture, is conspicuous by its absence? If first impressions are the strongest, he would likely think that he has come to the wrong place either to give an order or for information and suggestions.

Not only does the office, in the way it is fitted up and furnished, present an opportuinty for creating a favorable impression upon all who enter, but the publicity and sales-producing power of a well-furnished office must not be overlooked. As a means of educating the public to the attractiveness and desirability of high-grade woodwork, it is in a class by itself. Where the office walls are enriched with well-designed panel work and trim, and where the counter and other office fixtures represent the highest development of the woodworkers' art, a favorable impression is created and a desire aroused to possess attractive woodwork of a similar nature for the home, office, store, church, or lodge-room.

Of recent years some of the more progressive members of the woodworking industry in Canada have turned their attention to their offices, with the result that this end of their business has undergone a development from which the office emerged transformed and modern in every respect. Some have

P. W. Gardner & Son, Galt, Ont., realize the value of an attractive office.

Substantial Office Building recently completed by Walter T. Piggott Lumber Company, Windsor, Ont.

Attractive interior of office of Windsor Lumber Company, Windsor, Ont.

New Office with warehouse above erected by John Hancock, Toronto.

New office and warehouse of the Seaman-Kent Company, Toronto.

Attractive oak panelling and woodwork in Watt Milling & Feed Company's office.

Large window makes office bright and cheerful.

erected handsome office structures, while others have been content to instal high-class woodwork, and thus bring this department in line with their ideals.

Increases Demand for Good Work

Some of the newer developments along this line are to be found in the accompanying illustrations. As intimated before, first impressions count, and these modern buildings can hardly help but create favorable ones. Not only that, but an attractive office lends an air of distinctiveness that could be secured in no other way. The psychological side of having a fine office could be dealt with at much greater length, but suffice to say that not only are all who enter influenced, but it has a subtle effect on the management and every member of the organization.

Another phase of this subject that should be considered is in connection with displaying the products

The visitor cannot help but note attractive woodwork. R. Laidlaw Lumber Co., Toronto.

of the plant. Not only will the attractive woodwork of the office create a desire for fine interior trim and panel work, but by making a striking display of the finished output of the plant, sales can be made in many unexpected directions, and the volume of business increased. Some woodworkers have fitted up display rooms in connection with their sales department which are veritable stores of attractive wood products, both finished and unfinished. This departure is illustrated in a number of the views shown. By finishing each side of a door or piece of panel differently, it becomes an easy matter to show a customer what a certain item will look like when stained, painted, or enamelled.

Uesd for Selling Purposes

The Watt Milling & Feed Co., who operate a large woodworking plant in Toronto, have carried out this idea in finishing their recently completed offices. An interior view, showing one corner of their main office, will be found among the illustrations. The main office is finished with selected oak. Panel-work, trim, counters, and other fixtures are of the same material. Each of the private offices, of which there are four, are finished and panelled in a different wood. Thus, if a customer wishes to see what a door or piece of panel work in oak, gum, walnut, mahogany, or chestnut looks like when completed, he can be taken to the part of the office finished in that particular wood, and the many beauties and advantages of it pointed out in a convincing manner. This is merely applying modern sales methods to the selling of woodwork.

If your office could best be described as a hole in the corner or cubby-place in which an accumulation of shavings and dust is visible on all flat surfaces; in which the floor and counters are littered with odds and ends from the shop, and which is anything but attractive, it might be well to take these suggestions to heart. Money spent in sales-building, confidence-creating work of this kind is money well spent. Another point is that the woman of the house is taking an ever-increasing interest in the woodwork of her home, and as a result you must make your premises attractive to her. The business which is influenced by the lady members of the family, will, certainly, go to the plant which caters to her tastes and comforts, and which provides an attractive place in which to conduct all business.

Let us face this thing squarely. We are all interested in raising the status of the woodworking industry to higher levels, in creating a demand for better woodwork, in educating the general public to the intrinsic worth and value of attractive surroundings. We are supposed to be experts in all phases of fine woodwork; our opinions are supposed to carry weight and authority. Surely it is not unreasonable to expect that before we are to be looked up to and consulted, before our opinion is sought and considered, we must give a visible evidence of our skill and our ability in this direction. This may be best accomplished by finishing our offices in a striking and impressive manner. Let each and every one endeavor to place and maintain not only the office but the whole plant on a plane compatible with the great industry of which we are a part.

ROTARIANS LUNCHEON AT WOODWORKER'S PLANT.

On Wednesday the 27th July, Messrs Radford-Wright-Wilson Co. Ltd, Winnipeg entertained nearly two hundred Rotarians at a luncheon held at their premises.

The lunch was supplied by the young women's Society of St. Andrews Presbyterian Church, who waited on the tables. Three long tables very daintily decorated with cut flowers, accommodated the guests, After a very enjoyable luncheon, the Rotarians listened to a very interesting address delivered by Mr. Howard Crocker, of the Y.M.C.A., Winnipeg, his subject being " Physical Culture."

The Rotarians before leaving the plant, were taken through the factory by members of the staff, who explained the working of the machinery, etc. The guests were highly pleased with their visit, and congratulated Mr. Wilson on the splendid buildings, and the exceptionally clean way in which the factory was kept.

A sectional chip breaker is a modern addition to a planer, which is very helpful for many things.

* * *

The stoker can tell the difference between saws that have been sharpened by an expert and those which have been sharpened by the odd man.

Attractive Display of Doors and Woodwork

Indicating how such items as doors and different trims can be shown to advantage.

Cheaper Instead of Greater Production

How Manufacturing Organization is Analyzed with View to Bringing Down Costs—True Value of Accurate Costs

By William Snaith, C.E., Associate Engineer with Forests Products Engineering Co., Chicago.

The article by Mr. E. W. McCulloch in the June "Canadian Woodworker and Furniture Manufacturer" on the "Distribution of Burden of Good and Bad Times" is by far one of the best discussions of a very timely subject. The writer is heartily in accord with the principals so well stated in the article. If it were not for the fact that it is the exception rather than the rule to find these principles adopted it would not be worth while to thus express agreement. The advocate of such methods is more likely than not to get a cold reception in the average manufacturers accounting office. Probably this arises somewhat because slightly more work is involved, but mainly because the accounting methods of the average business man have a long way to go before they come up to modern standards. Few realize that in the last decade or so accounting science has practically been remade. The coming of the Income Tax and other similar afflictions will perhaps turn out to be very much in the way of blessings in disguise if they lead to better methods of keeping records in the business world. It may not be too much to expect that the economies they will lead to will more than offset the actual outlay of money they call for.

It has been proved in numerous cases that a business with old-fashoned methods of accounting can go on showing profits while actually losing enough to wipe itself out in ten or twelve years. As soon as such a condition is revealed to the average executive he will turn to a Cost System like a drowning man clutching at a straw and it will likely stand him in as good stead. This is not said with any idea of belittling cost systems. They are as necessary as any other of the accounting records of a business but they are not cure-alls. One of the latest to join the division of the new science of accounting, they really are yet in process of digestion by business. Far too much has been claimed by some of the experts making a speciality of such systems and there is perhaps something of a reaction against what the average man feels is "red tape."

Bringing Down Costs.

It is not proposed to point out defects in cost systems or to explain why some of them have faied. It is a difficult thing at best to start any new idea and the process is one of trial and error to a large extent. The purpose of this is to emphasize the fact that more than a cost system is required by the average manufacturer at the present time. A cost system is part of an accounting system. The accountant keeps the records of the business, and Mr. McCulloch's article will guide the accountant to a more accurate record of one phase of his work. The article just touches on the fringe of another subject which is however, not lacking in interest and that is: How to lower costs in the face of falling demand, falling prices and with overhead not falling at all.

Just how seriously this question is being considered can be judged from the fact that in February of this year it has been estimated that one-third of the business houses of America were potentially insolvent in the sense that they could not possibly have paid their current debts. In Canada and the United States nearly four and a half million people are are out of work and there are other evidences of the depression which surrounds us. There may be good reason to believe that the worst is over, but there is a long pull ahead before times will justify the epithet "good."

What the manufacturer wants to know is how to make whatever he produces for less money than he ever did. To lower costs is his obession and the thing he thinks of and must think of all the time. His cost system is very likely telling him that in spite of some increase in the efficiency of labor his unit costs are not coming down very fast. The workman is on the horns of a dilemma. If he hustles and finishes all the work in sight he'll be laid off; if he dosen't hustle he'll be replaced by one who will. We are all human and any of us under these crcumstances would compromise. A lot of bad habits engendered by the war conditions of the past years when production practically regardless of cost was the rule, are with us yet. These must be eradicated and yet we have become so accustomed to some of them they seem only necessary evils.

Cheaper Not Greater Production.

"Cheaper production" takes the place of "more production" as the password to success. To the industrial engineer rather than to the accountant must business, and especially the woodworking industry, turn at this juncture. The accountant is giving business better records than it ever had but more than records is required. The industrial engineer brings to the problem of cheaper production the scientific methods of analysis and standardization, followed by a properly designed system of production control and a wage payment system where reward is in proportion to skill and work done.

Production readily stands first in the four divisions of business—production, finance, accounting and selling. It is the foundation on which the others build. Without production there is nothing to finance or sell and no need of records or accounting. Cost of production can not be lowered by the best system of records that the most brilliant genius can devise. If the cost of a piece of work is to be reduced it must be done before the work is started. Some saving may be possible while the work is underway but none at all when it is finished. Many a job which was started right has been spoiled when nearly finished by attempting too late to keep the cost within an estimate which was too low to begin with.

Records of past performance can be used in estimating future work only, (a) if the conditions have not been changed and (b) if the records are accurate and dependable. It is the exception rather than the rule for either of these conditions to be fulfilled. More especially is it exceptional for the records to be either accurate or dependable and when they cannot be relied on they are really worse than useless. Inaccurate cost data can only lead to inaccurate estimates. But even

if both conditions are fulfilled to perfection the most that can be hoped for will be that costs will not be higher than they were. There still remains the possibility which amounts almost to certainty that the old costs were unnecessarily high. What is lacking is a standard wherewith to measure performance. We can estimate with precision how much material will be required to make a certain article of furniture but when it comes to the labor cost we have not the same exact basis for our figures. We know (if our cost records are accurate) that a somewhat similar thing cost us so much at such a time for labor. Could another shop do it for less? They couldn't use less material, but could they put less labor on it? What should be the minimum labor cost? To supply the answer to these queries is the function of the industrial engineer.

Analysis of Product.

The first step in studying production is to know what is to be produced. This may sound somewhat trite, but the mere cataloguing of all the articles to be made in an average plant serves several purposes and will likely reveal some such conditions as these; some old lines which are obsolete and should be dropped, several articles which are so nearly alike that it is unprofitable to continue the distinctions; the main product for which the demand is known and new lines for whch demand is to be created. This list will vary from one single article to several hundreds of thousands with the size of the business. After this has been gone over carefully and all deadwood eliminated a list of all the component parts of each article is made. In the discussion of standardization we shall see that as far as possible the designs are modified to permit the same part being used in a number of articles. Our third list gives us all the operations on each separate part in their proper sequence.

A survey is next made of the machines and tools available for turning out the product. The speeds and feeds are determined and the capacities noted. Their condition is investigated as having a direct bearing quality. The layout of the whole plant also calls for study under this head. If possible the raw materials should enter at one end and the finished product leave at the other, but in actual practice this condition is a rarely attained ideal. The extent to which backtracking and unnecessary moves can be avoided is usually considerable. It is to be borne in mind in this connection if the moving of machines is called for that such expense will be incurred but once, while the cost of any additional handling or trucking is a continuing expense which may be sufficient in even a short time to pay for the change.

The study of the materials used and the manufacturing methods used need not be discussed under this head, although their analysis forms a part of the complete analysis of the product. They will be dealt with in connection with standardization.

Standardization is Foundation.

The foundation stone of modern manufacturing is standardization. It is not enough to standardize the product itself; the methods and machines must be standard also as well as the materials used. To a certain extent the men who do the work must come up to a certain standard, although it is likely that some of the steps in this direction by some authorities go further than is necessary. It is the part of wisdom to select men with some regard to the work they will have to perform, using size and strength for heavy work and skill and experience for the finer lines. It is variously estimated that the cost of breaking in a new employee runs from $50 to $250 and in special cases to much higher figures. Cutting down the labor turnover results in a saving which can almost be measured in dollars and cents.

In the case of materials when once the most suitable material has been found a brief specification covering is prepared and future orders must conform to this. In the case of small parts such as nails, screws, bolts and nuts a complete description is prepared so that no difficulty will be encountered by a firm receiving an order for them in filling. In these days of specialization there are so many varieties of even the simplest things that the chances are multiplied of getting something sufficiently different, although of the same class, for the variation to be serious.

After trying out various methods or different series of operations the best and most economical is chosen as the standard and this will be adopted for all future work until a cheaper of better way is devised. The extent to which it will pay to experiment in determining the best method of performing an operation will depend on the number of times it is performed. In the case of special operations in repetition work where the same operator is constantly engaged on the same operation the ultimate developments along this line is motion study with a motion picture machine. The classic example of painstaking study in determining the best set of motions is the series of experiments by Mr. F. W. Taylor on shovelling in the plant of the Bethlehem Steel Company. When once the best method has been decided on it is written up in the form of standard instructions to govern all future work.

The industrial engineer is not usually responsible for matters of design, but as a general thing the establishing of a system of standards will reveal possibilities of changes in existing designs in the direction of further standardization. The same part can perhaps be made to fit into several articles. Where a varied line of goods has been made for some time without any special attention to this feature the standardizing of designs is likely to result in some surprising economies. It is not at all uncommon to reduce a diversified list of similar parts to one quarter or even one tenth without perceptibly changing the appearance or in any way detracting from the quality.

Wage Payment Systems.

Nothing else is wasted in a manufacturing plant to the same extent as labor and nothing is paid for on the same unscientific and unfair basis. In buying everything else we know ahead of time what the price is going to be and what quality to expect. In buying labor at so much an hour we may know what quality to expect but the quantity is undetermined. It is unfair to both employer and employee that this should be so. Payment in proportion to value and amount of work done can not be achieved otherwise than by some form of piece work. It is perhaps not too much to say that without standard times in which operations are to be performed and the rates of pay based thereon, it would be impossible to accurately plan the sequence of a series of operations or to make much better than a guess as to the probable cost. What opposition there may be to piece work has its cource, not in anythng inherently wrong in the system, but in the unfair ways in which it is commonly used. Piece rates have been

based on past performance without a proper study of that perfrmance to determine whether it represented a fair output produced under proper conditions. Very few men work at a rate more than half of that of which they are capable and the difference btween a man merely holding down his job and another actively interested in getting all he can get out of it is surprising. If now a rate is calculated from the output of an operator working under unstandardized conditions and only moderately interested there can only be two results. The operator with only slightly increased effort and taking advantage of the incentive to devise better methods will increase his production perhaps to double what it was before. The man who set the rate, apart from any criticism he may come in for, is bound to feel that the operator did not previously work at a fair rate and almost inevitably the rate will be cut. This will seem like an injustice to the operator and he will see to it that he does not further increase his production and thus forestall further cuts. Manifestly under such circumstances it is extremely difficult to reduce costs.

It is quite possible to determine the time an operation should take by careful analysis of the motions ar revealel by a time study and after making an allowance for personal time, machine care and incentive, to set a rate which can be guaranteed against change as long as the standard conditions under which the work is to be done are unchanged. If speeds or feeds are afterwards changed or standards of quality are altered the rate is proportionately increased or decreased, but the same financial effort on the part of the operator will result in the same financial reward. If some system of paying for suggestions which result in increased production is used there will exist conditions which are bound to reduce costs and increase output.

Many systems of bonusing all output over a specified task have been devised but all seem to have met with indifferent success. The extra clerical work involved, the smallness of the bonus, the more or less involved calculations, preventing the operatior from knowing from day to day what his bonus amounts to, the use of such terms as "tasks" and perhaps "bonus" itself, have been among the reasons for failure.

In a properly designed piecework system the rates will be equally fair to both employer and employee; the cost of work will be known accurately and in advance; wages can be raised without entailing a revision of the piece rates and old and proven employees will receive a higher wage than new men doing the same work. The result can only be satistaction, absence of labor troubles, reduced turnover and increased production.

Production Capital.

To really control production so that all necessary parts reach their sub-assemblies at the right time for the sub-assemblies to reach the final assembly in the proper sequence and time is as fine an example of organization as can be found. By anything short of the thorough analysis already outlined and without standard methods it is not too much to say that it is impossible unless the work done is very simple indeed. To explain at any length the actual methods used would take more space than would be justfied in this article. Not only does each branch of industry call for different methods, but the organization of each individual plant must be considered and its pecularites of layout, personel location, and many other things. There are fundamental principals, however, which apply universally and if these are complied with a workable system will be evolved. It is not enough to design the system. A bridge is not built when the drawings are finished, and there is as much labor involved in putting a production control system into operation as in building anything else from plans and specifications.

Above all things, such a system must be flexible. There are always several ways of doing anything and emergencies are bound to arise. The system must not be disrupted if in an emergency standard methods are temporarily discarded and work rerouted through other channels. In fact it is not too much to say that a system is a success in proportion to its ability to handle the unusual in an efficient way and quickly return to normal afterwards.

Gives Fullest Information.

The production records in the system sketched out above are unusually complete and yet there is no duplication. From them the accountant can obtain costs that can be relied on to be accurate. The selling department can make estimates with certainty. The management can use them as standards wherewith to measure efficiency of departments and men.

To sum up the need of the hour is cheaper production. This will not be obtained by systems of keeping records, necessary though these are. Costs must be lowered before the work is started. By proper analysis, study and standardization of the elements of the product followed by production control costs will be lowered, which is of present interest, and production will be increased, which is of future interest. Incidentally better and more complete records will be obtained and labor troubles will disappear.

Will Prospect Island Railway Belt

Through its subsidiary corporation, the Consolidated Mining and Smelting Company, the Canadian Pacific Railway Company has undertaken to make a thorough mineral survey of the Esquimalt and Nanaimo Railway Belt of Vancouver Island. Engineers will be engaged to inspect all prospects that have not passed out of the hands of the company and geologists will make reconnaissance of the mineralized zones of this area of over 2,000,000 acres. It is planned to obtain complete information of the mining possibilities of this section. This work will be preliminary to the negotiation of an agreement with the Provincial Government for the elimination of what is described as the "Dual Control of Minerals within the E. and N. Belt."

The Hon. Wililam Sloan, Minister of Mines, has devoted long and careful attettion since 1918 to the problem of bringing the minerals of this belt within the sole jurisdiction of the province. The progress, however, has not been as rapid or as satisfactory as he could have wished because of the reluctance of the C.P.R. to release underground resources without a more exact knowledge of their economic value and potentialities. In correspondence tabled by the Minister in the B.C. Legislature recently, it is indicated that the C.P.R. has come to realize that the present situation—requiring that title to mineral lands within the area must come both from the Province and the Company—cannot continue.

Inventor is Guiding Genius of Unusual Plant

Arbuthnot Woodworking Factory in Vancouver is Full of Clever, Practical Appliances Designed by the Owner-Manager

By Geo. S. Perry, Vancouver Representative

An all-electric-driven woodworking plant in Vancouver, which well repays a visit, is that of the Arbuthnot Lumber, Sash and Door Co., of which the moving spirit and guiding genius is Mark Arbuthnot. He is a mover all right and a genius as well, the number of special appliances of his own invention in use in all parts of the shop showing his practical genius. Some of his inventions have been patented, and others he has not taken the trouble to apply for patent rights.

One or two of the leading devices he has designed have been adopted by other woodworking plants, and some of them bid fair to be in every shop in the country before long. His measuring rule attached to the table of several of his machines, is being used by a good many mills. Mr. Arbuthnot looks to the day when no machine will be sent out by the manufacturer without his measuring rule attachment. He points out that half the time of a workman is taken up in making measuerments and changing the machine to cut to that particular measure. With the measuring rule, which he makes of steel, actually a part of the machine, the operator merely adjusts to the desired measure instantly. This change he can repeat inedfinitely, as often as the work requires. The efficiency of most of the machines used in cutting stock to measure is doubled by the appliance. The making of the rules is as original as the idea of attaching them. When he first tried to buy the rules, manufacturers in the States quoted him a prohibitively high figure. Arbuthnot is resourceful. He sat down and studied the thing out. Then he went to work and made himself a rotary die to cut the inches and fractions on the steel bars. For a trifling charge he was allowed to attach this die to one of the machines in the Wallace Shipyard shops and run his bars through, the result being that he turned out 75 accurate gauges in an hour or so.

Many Interesting Features

All through the Arbuthnot factory similar original ideas of a practical nature are put in effect. On an American shaper he has put a morticer attachment of his own device, which is as nearly automatic as such a rig could be. It is clamped on and with a series of stops, set in segment of a circle, each piece of a sash may be fed in, in its proper place, and cut to correct measure. On the same machine he has a simple attachment which makes it do duty as a panel raiser. On an ordinary cut-off saw is found a friction attachment, made with a strip of wood on an arm attached to the bearing of the saw and engaging two small pulleys. By stepping on a treadle lever,

Vancouver office, Toronto General Trust Co.
Woodwork by Arbuthnot Bros.

the two pulleys engage the strip of wood, pulling the saw back swiftly after each cut. The capacity of the machine is thus speeded up very highly. On his band re-saw, Mr. Arbuthnot has one of his most valuable and noted inventions. It is a spring tension tightener, doing away entirely with the tightener weights. In this, Mr. Arbuthnot claims to have solved the question of cracks in band saws, of all sizes. An expert band-saw man himself, the inventor points out that the unusual jar given the delicate steel band, when any sudden strain causes the weight to drop heavily, is the cause of cracking, and all band saws are subject to them. He is using a saw which had cracks when he put on the spring and

Office, factory and warehouse,
Arbuthnot Bros., Vancouver,
British Columbia

Interior view, Arbuthnot Bros ' sash and door factory,

disconnected the weights. These cracks have made no further progress, and the saw is good for long use yet.

Spring Tension for Band Saws

But perhaps the best of all his inventions, and one he has patented everywhere, is his automatic grinder for band saws. By this attachment or machine, he can grind any band saw down from one gauge to a thinner gauge, thus making a saw available for lighter use when it has been reduced in width past its original use. This grinding process will also take out all the inequalities caused by the saw-filer's hammer in setting and balancing the saw. When he is ready to go to the mills with this new device, he is going to show the big fellows where he can effect savings of thousands of dollars in extending the life of band saws, now discarded.

It can easily be gathered that the Arbuthnot plant is strongly marked by the originality of the clever inventor who directs it. For all that, it is not a freak institution by any means. It is equipped with a full line of machines for the making of doors, sash and frames, and for detail building and cabinet work. Its ordinary capacity is 150 doors and 300 windows per day. Thirty-five men are at present employed, and more are being added. It takes in all 320 h.p. of electrical energy to operate the plant, and the only steam generated is for the dry kilns and for the glueing and finishing rooms and for any heat required. The lumber is brought by truck or rail to the plant, which is located in the False Creek industrial area of Vancouver, close to many of the sawmills. The lumber goes direct to the kiln for drying. Hot air circulation with a fan system and a direct live steam pressure is the combined system of drying, thus preventing case-hardening of the wood. On the ground floor are the re-saw, a Yates machine, also a Yates 15-inch planer and matcher, a Woods 15-inch moulder, a C. M. C. 8-inch sticker, and a 3-inch drum sander by the same concern. A self-feed rip-saw is also part of the equipment. On the mezzanine floor are electrically-driven cut-off saws for stock, the lumber after going through the stickers being brought up by freight elevator. On each cut-off saw and tenon machine is attached one of the rules above referred to, greatly increasing the capacity of the machine. An American shaper and a Cowan & Co. tenoning machine, a Zimmer panel raiser, a combination door and sash sticker by the C. M. C., and a morticer are among the principal machines included in the plant. Each has its own electric motor, with independent control. Every machine is connected up with the blower system,put in by the John K. Miller Co., Vancouver, and two 50-inch fans actuated by a 50-h.p. motor carry all the shavings and dust to the storage and boiler house.

Building a Reputation

The Arbuthnot factory has the reputation of turning out some of the finest detail and stock doors in Canada, especial attention being paid to finish, in which the doors excel. Just now the factory has in hand, among many local orders, one for 600 doors for Australia. All sorts of cabinet work, office and bank fixtures, special furniture, and detail orders, are turned out, as well as meeting a big run for ordinary stock sizes and patterns of doors and sash. Mark Arbuthnot is a young man, not yet past thirty. He has spent all his working life in a woodworking plant, and with his rare inventive talents, added to his practical knowledge and extremely energetic nature, he is going to make his mark in his calling. He is a capable business man, and is ably assisted by his brother, R. Arbuthnot, who takes charge of the office. Recently the firm moved to the building formerly occupied by the Prudential Company, now out of existence. The premises are very large and allow plenty of room for expansion.

World's Coal Production in 1920

Year.	Production.*	Per cent.†	Year.	Production.*	Per cent.†
1910	1,160	39.2	1916	1,296	41.4
1911	1,189	37.9	1917	1,345	44.0
1912	1,249	38.8	1918	1,331	46.2
1913	1,342	38.5	1919	1,158	42.9
1914	1,205	38.6	1920	1,300	45.1
1915	1,196	40.4			

*In part estimated. †Produced by U. S.

The fluctuation in world coal supply become somewhat clearer if expressed as index numbers, taking the output in the year 1913 as equal to 100. The production in the other years then becomes as follows:

1910 86	1913 100	1916 97	1919 86
1911 89	1914 90	1917 100	1920 97
1912 93	1915 89	1918 99	

The manner in which the outlying countries came to the assistance of Europe is shown in the following table, which gives production in metric tons, by continents, before and after the war:

Continent	1913	1920	Inc. (*) or decr. (†)	P.c. of change
North America	531,600,000	601,300,000	* 69,700,000	*13.1
South America	1,600,000	1,700,000	* 100,000	* 6.2
Europe	730,000,000	597,500,000	†132,500,000	†18.1
Asia	55,800,000	75,800,000	* 20,000,000	*35.9
Africa	8,300,000	11,800,000	* 3,500,000	*42.2
Oceania	15,000,000	11,900,000	† 3,500,000	†20.7
World	1,342,300,000	1,300,000,000	† 42,300,000	† 3.2

How Drying Period May Be Shortened

Increasing Circulation Increases Efficiency of Kiln, Tends for Uniform conditions and Fast Drying — One of the Most Important Factors in Operation of Dry Kilns

By P. E. Poole

If a woodworker or kiln operator were asked whe ther heat or circulation was the more important in the artificial seasoning of lumber, he would probably reply that heat was of far greater importance than the movement of air. In this opinion he would be supported by the majority of those engaged in the same line of endeavor. This only goes to show how the essentials of good kiln-drying are regarded by those in the industry.

Modern kiln-drying practices emphasize the importance of proper temperature, adequately controlled, but considerable stress is also placed on adequate circulation. Ty my mind the latter is more essential than the former. If lumber were placed in a kiln in which there was no air movement, it would not dry regardless of the temperature carried. If the heat were shut off and cool air forced through the stock, the moisture would be slowly but surely picked up. This would seem to indicate that heat without air movement is futile, while circulation without high temperature is capable of drying lumber.

Both Factors Necessary.

This point is mentioned simply to convey an idea of the part that air movement plays in the kiln-drying of lumber. Both are essential for satisfactory results; heat to evaporate the moisture, to hasten its movement to the surface of the boards, and, in many kilns, to induce circulation; circulation to distribute the heat, carry the warm, comparatively dry air through the piles and to carry off the moisture-laden air. To ensure an even distribution of heat and even drying, the circulation should be the same in all parts of the kiln.

It has been stated by many authorities that the speed with which lumber may be dried is limited by the rate at which the moisture moves from the centre of the lumber to its surface. Heat hastens the rate of transfusion, but it stands to reason that it cannot be evaporated from the surface faster than it moves outward. Another feature that retards drying is uneven distribution of heat and uneven circulation. While the moisture may be eliminated as fast as it is carried to the surface, the rate of drying or rather the drying period is largely controlled by the rapidity with which the stock dries in the coolest spot or where the circulation is most sluggish. It is doubtful if an even distribution of heat is secured without an active circulation, which would lead to the conclusion that the drying period is in many instances unduly prolonged because the air movement is not sufficient to ensure rapid, uniform drying.

Securing Greater Uniformity.

The relative humidity of the air governs the rate of evaporation, irrespective of the rate at which the air is moving. On first thoughts one would likely jump to the conclusion that by increasing the rapidity of the circulation, the drying speed would be increased in proportion. This is where the humidity plays its part. Regardless of the rate of circulation air at a certain temperature and containing a fixed percentage of relative humidity can only absorb a certain limited quantity of moisture, and is not capable of drying the stock below a certain fixed percentage of moisture content That being so, what advantage accrues from maintaining a lively circulation?

Let us consider the progressive type kiln for a moment. The lumber enters at the green end and is then moved step by step until it reaches the dry end and is ready to be taken out. The difference in the relative humidity between the green and dry ends of the kiln is due to the fact that the warm, dry air enters at the dry end and as it progresses toward the outlets at the green end it is continually picking up moisture from the lumber, with the result that by the time it reaches the green end it contains nearly all the moisture that it is capable of holding, with the result that drying at this end is retarded. It will readily be seen that by increasing the circulation in a progressive kiln, the aid would not contain as high a percentage of relative humidity when it reached the green end as with a slower air movement, and as a consequence the stock at the green end would be dried with greater rapidity. By increasing the circulation still further a point could be reached where the stock at both ends would dry at practically the same rate, or in other words, the lumber would be dried at a uniform rate from end to end of the kiln.

Shortens Drying Period.

The same holds true, to a lesser degree, of course, in the case of each individual truck-load in either a compartment or progressive type kiln. Unless the movement of air is sufficiently rapid, the section of the load through which the warm air enters will dry faster than the section through which it leaves the pile As drying must be carried on until all the stock is uniformly dry, the drying period is really governed or controlled by the rate at which the lumber dries at the points where the drying is slowest. Thus, if the circulation is not rapid enough to enable the lumber in any pile to dry evenly, the drying period is unnecessarily prolonged. This is also the reason why the arrangement of flues and ducts must be such that the circulation is uniform in all parts of the kiln. Should it be slow or sluggish in any section, the drying in that particular part of the kiln will be retarded, necessitating a longer drying period. It will then be seen that it is absolutely necessary that an adequate circulation be uniformly maintained in all parts of the kiln. When that obtains, the rate of drying may be controlled by the humidity of the air.

To outline what constitutes an adequate circulation is not an easy matter. It is all well enough to say that a circulation that carries off all moisture at a uniform rate from all parts of the kiln as fast as it reaches the surface of the stock, is an adequate circulation, but to define it in terms of cycles or volume of air movement is another matter. Some manufacturers of dry kilns claim they can maintain an adequate circulation by natural methods simply through the number, size and arrangement of flues and air ducts, while others resort to mechanical means either through the use of a fan or blower or by means of a water spray or a condensing

coil to accelerate the air movement. One kiln manufacturer claims to change the air in his kiln three times a minute and as a result is able to shorten the drying period by 50 per sent.; not because rate of drying is increased, but because the slow sections, which length ened the drying period, have been corrected or eliminated by the increased circulation.

It might be a good suggestion for every kiln operat:or to check up the circulation in his kilns (a simple method was outlined on page 98 of the March, 1921, Canadian Woodworker.—The Editor) and locate the places where the circulation is slow and then take the steps necessary to overcome this sluggishness. If that were to be done, the drying period might be reduced, increasing the productivity of the kilns and lowering kiln-drying costs, without increasing the tendency to casharden or check or without pushing the drying operation beyond the limit of safety to the stock.

Foreman Relation to Modern Industry

Has Assumed New and Important Duties — Forms Connecting Link Between Management and Men — Must Meet Latter on Footing of Equality.

By R. J. Waldo.

Modern manufacturing methods and their rapid progress towards specialization demands now more than ever before that foremen be selected with exactness equal to any other executive position in modern industry. It has been only within the last few years that the foreman has come forward and proved that the place he held was one of sufficient importance to class him as an executive and to command equal hearing of other department heads.

The foreman of the earlier days was simply a man who hired, fired and directed his work as best he could, considering the amount of time he was required to spend away from his department, especially upon Monday morning. The foreman of to-day remains in his place and personally supervises the entire workings of his department at all times. When he has need for a new man he makes requisition upon the employment department or the superintendent who is responsible for all the hiring, while he keeps in close touch with his men and hold production to its maximum.

Some of the Duties of the Foreman.

Let it first be understood that the foreman, if he is to be successful, must be capable of varied duties. He must be broad-minded enough to see all the factors interrelated with his work. He must be thoroughly conversant with his duties and not overstep another department head.

The present-day foreman usually has assigned for his aid a capable assistant, who relieves him of a great many of his minor duties, leaving his time to be used in the accomplishment of his greater tasks.

Previously all material which was used in his department was checked by him personally to be certain that it was the proper material for use. Now it is checked and carefully placed in the stock-room for use as ordered. Former methods held him strictly to overseeing the actual manufacturing operations. Now, with modern methods of inspection, he is relieved of much of this by the floor inspectors, who continually gauge finished material at the machines. This proves far easier with the automatic machinery now being used with their gauges and automatic control of tools. Formerly he personally kept the order department posted upon the condition of finished material coming through. Now this is attended to by the production clerks, who are a part of the department.

One condition which has not changed is, when a man wants a raise in wages he goes to the foreman and asks for it. To handle these cases in a fair manner and one which is satisfactory to both employee and employer the foreman must possess a sense of judgment in such matters so that he will be ever willing to see a man give the worth for his wages as well as get an ample reward for his service.

If the foreman feels that the man asking for more money is not worth more he must be able to tactfully inform him that he is not at that time worth more and leave the man with a feeling that he is being fairly treated. This takes a sort of tack hard to find in the majority of foremen. If this is not done in a satisfactory manner the man will feel that he is unjustly treated and will leave. This sort of leaving adds unnecessary expense to the production cost. The man has been trained in the special methods of the company, and it is up to the foreman to hold him as long as he can and prevent repetition of this training cost factor, if possible.

Called to Settle Grievances.

The foreman is called into a delicate task when the worker cannot agree with the man next to him, or has had some misunderstanding with an employee in the department. Usually both men threaten to leave, and unless properly handled they will leave. In the larger corporations the man is sent to the director of personnel and there the grievance is settled. However, in the smaller plant the foreman is the meditator and in dealing with this certain function he must possess a diplomatic manner which will bring both men to realize that he is willing to meet them fairly.

Perhaps another employee feels that some employee of the department is being promoted faster than another. The latter often complains. It is the tactful foreman who is able to show the man who complains that the one promoted has been preparing himself for the better place and because of his perseverance in his study is being rewarded. Again, if the foreman is the true type of executive he will at the same time encourage the latter man, suggesting that he, too, can prepare himself for a better place if he will but sacrifice some of his pleasure for study.

Supervize Piece-work Rates.

In shops where payment of wages is made by the piece rate method it often occurs that one man will receive by accident pieces which make for him a most desirable wage. As these orders are handled by the dispatch dpartment, and not by the employees of the department, employees often feel that some one other employee is being treated better than themselves. No

foreman can handle this sort of a grievance in an unthoughtful manner. To the contrary, he must be willing to explain how it is actually handled and be certain that the men understand it.

Being a pal or one of the men is a most important part of the foremen's duties. I know of no better way to illustrate my point than to cite two striking instances which are in contrast. Some time ago I was passing through one of the most modern plants making phonograph bodies. The men were on piece-work schedule and a lad was employed to take material from the stock-room to the men. While standing near the stock-room the foreman called to the lad and informed him "Number 68 wants a pot or glue." However, the lad immediately responded. Little was thought about this until about two weeks later while passing through a chair factory I overhead a foreman instruct the stock mover: "Oh, Bill, take that load of side pieces down to Jack. He is about out." This coming from a foreman in a plant less modern than the first one mentioned, was a striking contrast to the later. However, the spirit of friendliness shown in calling a man by his name rather than by a number appeals to men and makes them work better and beyond doubt harder. Numbering a man seems to make him mechanical. The modern foreman will learn the name of every man in his department as soon as he can do so and to his advantage.

Must Have Their Confidence.

He will not only be one of his men, but will be willing and expect to leave by the same door as his workers. The writer has personally seen foremen who have left the shop by a separate door. This is not, however, the method used by the successful foreman of the present day. Certain corporations who have installed lunch rooms for their men who have set aside tables for use of their foremen. These things are noticed by the workers, and if he will obtain their maximum production he must be one of them and mingle freely with them.

In contrast to the foregoing the writer has seen foremen spending the evening with his workers and joking as freely with them as some foremen would joke with their superiors if they could. I have seen foremen take a chew of tobacco out of a workman's package and have seen workmen have a chew offered them by their foreman. These things, while not applicable to in the sense given by all, yet the fundamental principle is the thing I wish to bring out.

(Continued in September issue.)

Wood Separators for Storage Batteries

Canadian Woodworkers turning their attention to Battery Separators—Preference being given to United States Manufacturers—Outline of Various Operations

The manufacture of wood separators for electric storage batteries is an industry that has had a remarkable growth in the United States during the last few years. These pieces are used in many makes of storage batteries to separate and insulate the battery plates. Naturally with the growth of the automotive industry and the increasing demand from other sources for storage batteries, the market for separators has increased in proportion. Nor has the limit been reached.

In Canada the same does not hold true. While there are one or two woodworkers manufacturing this line, they do not receive the support they should from the manufacturers and distributors of storage batteries in this country. It is estimated that from fifteen to thirty million wood separators are used in Canada each year, yet only a very small proportion of these, a negligible quantity, is the product of Canadian plants. The reason for this is not that Canadian separators cannot be made as good or as cheaply as the American article, but rather that the largest users of separators in Canada are branches of United States houses, and they buy from their American organizations, even when the Canadian product can be secured for a lower figure. Some of them have even gone a step further. The service stations, which are located in various centres throughout Canada, utilize a large number of separators each year for repair work. These stations, which are strictly Canadian, were showing a preference for the home-manufactured product. This did not please those in charge of the larger battery houses (Canadian branches of American firms), who threatened to cancel their agencies unless the separators used were purchased from them, which meant unless American separators were used. This seems to be a short-sighted policy. These Canadian branches are selling in Canada to Canadians and should favor a Canadian product wherever possible, price and other things being equal.

Require Skilful Handling.

A glance at the accompanying sketch will give an idea of what the separator is like. The size and thickness will vary according to the make of battery for which they are intended, but 4 x 5 x 3-32 may be taken as average dimensions. They are grooved on one side as shown. Many different woods are used, though cedars, such as Port Oxford, B. C. red, B. C. yellow, and Ontario cedar, together with basswood, seem to be prime favorites. Other woods used include redwood, cypress, cherry, poplar, and Douglas fir. The wood must be light, porous, not too soft, of good insulating qualities, and highly resistant to the acid with which the battery is filled. It is this latter quality that makes cedar such a favorite.

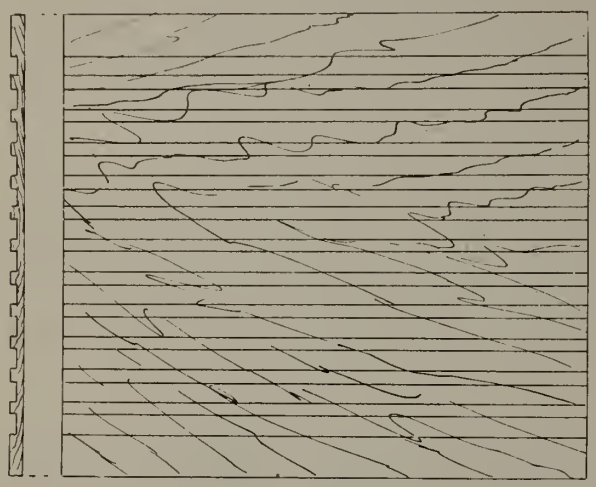
Naturally, the machining of such a thin, fragile piece of wood is a ticklish job. The stock is worked up in the rough to a suitable size, the splitting or resawing being usually done on a band or very thin circular resaw. It is not unusual to get seven pieces from an inch. In some batteries, rotary cut veneer stock is used, but the sawn material makes the best separator. The material should not be too dry, otherwise the loss from broken and split pieces will run high. About 12 or 15 per cent. moisture content is the best. After resawing to thickness, the planing and grooving is done on a moulder.

Special Attention to Machine

The bed of this machine must be smooth and true and all the openings filled up. Both upper and lower feed rools should be adjusted very fine with little or

no lead. It might be advisable to fill the space between the upper rolls with wood blocking. The same applies to the space between the rolls and chip-breaker. This latter should be faced with hardwood and set as close to the cutter head as possible.

Special milled cutters are usually employed for making the grooves. These are set the reverse of the usual way so as to secure a scraping cut. Some advocate a set of milling cutters or saws for this purpose, every second saw being smaller in diameter



Sketch showing details of Wood Separator.

than the one on either side, the difference corresponding to the depth of the groove. More cutting edges would be secured and the saws could be set staggered, breaking up the cut.

The side heads, when used, are fitted with ordinary cutters. Some advocate running one of the heads backward, preferably the outside one, so that the stock may be grained. The same idea is sometimes applied to the top head. All cutters or knives should be joined and maintained in a sharp, keen cutting condition.

The shoes and guides must be set close to the work, but not tight enough to bind. Feeding thin stock like this, if there is any binding or resistance, a lot of trouble will be experienced from breakages.

Pieces Chemically Treated

After the stock comes from the sticker, it is cut to length, a clipper knife doing the trick, and then sorted or graded. The pieces are then boiled for a number of hours in caustic soda, to remove all resins, acids, and other wood impurities, and then washed in a weak acid solution. From now on the pieces are not allowed to dry out, but are packed in airtight packages, usually with waxed paper, and kept that way until required.

There is a demand for both treated and untreated separators, as some battery manufacturers prefer to treat their own stock. The price varies, depending on the size of the separator and the quantity purchased. It runs all the way from $15 to $35 per thousand.

If all the Canadian business could be secured by local concerns, it would amount to a nice sum. Putting it conservatively, say the requirements are 15 million annually at $20 a thousand, the volume of business would amount to $300,000 or more a year. At the present time at least two companies are working on this proposition, but as intimatd they have not succeeded in persuading the larger manufacturers to use a Canadian product.

Electric versus Belt Transmission

Interesting discussion of both types of drive—Efficiency of each drive compared—How poorly designed belt drives waste power—Hints for aligning shafting

By W. F. Schaphorst, M. E.

(In this discussion Mr. Schaphorst deals mainly with plants which generate their own electric current. The majority of the woodworking plants in Canada using the electric drive, purchase their power, usually at very favorable rates, paying only for the amount of current passing through the meters. That being the case, the efficiency of the generators may be rated as practically 100 per cent., under the assumption that about all the power paid for is delivered to the motors, i.e., that there is no transmission loss between meters and motors. Where this holds true, there is only the efficiency of the motors themselves to consider, and from the figures given in this article, the average motor efficiency is satisfactorily high.—The Editor.)

Many woodworking plants have already installed electric power, and they say it is good. They say that it is more economical than belt transmission and that they are "going to stick to it."

The writer has always been an advocate of belt transmission in the woodworking plant as regards efficiency of transmission and power consumption, and he will not change his opinion until generators and motors of the smaller sizes are made more efficient. It is true that electric transmission, individual drives, and even group drives, "look" better. The electrically-driven shop usually has a cleaner appearance. There is no overhead belting to cut off the light, to take up space, to slip and squeal, to run off, or to require periodic attention. All of these things are admitted.

In the electrical transmission of power we always have at least two efficiencies to consider—the efficiency of the generator and the efficiency of the motor. Where the distance between generator and motor is great the line efficiency also must be considered, but in most woodworking shops using electric power distribution the line efficiency is so nearly 100 per cent. that it can be neglected.

Conditions Control Type of Drive

Herewith is a small chart prepared by the writer which gives the "combined efficiency" of the generator and motor. The line efficiency is assumed to be 100 per cent., and is therefore neglected. For example, to use the chart, if the efficiency of the generator is 91 per cent., and of the motor 79 per cent., the dotted line across the chart shows the combined efficiency to be 72 per cent. The chart will figure any combination where the efficiency of either generator or motor is over 50 per cent.

One of the many mooted questions is: Which is better—electric or belt transmission? The correct answer is: "It all depends upon conditions." The

object of this chart, therefore, is to help you answer the question for yourself.

With ball bearings and low belt tensions, the efficiency of belts and shafts may reach a very high figure—98 per cent. and even over. That is a point that must be taken up with the manufacturer. But if it is made certain that belt transmission will provide even 80 per cent. efficiency, that, in most cases, would eliminate the electric drive, although, of course, efficiency is not the only thing to be considered.

To assist users of the chart, I give these average efficiencies of generators and motors at full load: Direct current generators—50 kw, 90 per cent.; 100 kw, 91 per cent.; 1000 kw, 93 per cent. Motors—¾ h.p., 64 per cent.; 5 h.p., 80 per cent.; 15 h.p., 84

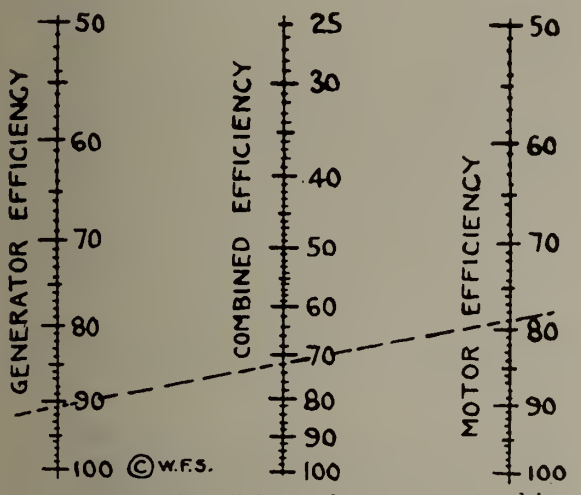


Chart for calculating efficiency of motor-generator drive.

per cent.; 30 h.p., 90 per cent.; 150 h.p., 92 per cent. Alternating current generators—50 kva, 90 per cent.; 100 kva, 91.5 per cent.; 500 kva, 94.5 per cent.; 1000 kva and over, 95 per cent. Motors—1 h.p., 76 per cent.; 10 h.p., 85 per cent.; 100 h.p., 90 per cent.; 200 h.p., 92 per cent.

How Power Is Often Lost

If belts are not properly cared for; if shafting is not carefully aligned; if belt tensions are maintained too high; if much belt slip is permitted; if the oil can is not used regularly; if the bearings are not kept clean; and if the bearings are not babbited when they need it—and this is the way belt transmissions are too frequently operated—then, under such poor conditions, the writer recommends electric drive. The upkeep of electric drive is less expensive. The first cost is greater. The efficiency does not become worse so quickly as with poorly kept and poorly operated belt drives. However, as already stated, by being careful one can often get more out of belt drive than out of electric drive.

One of the things that the operator of the woodworking plant should guard against is—belt trains. Belt trains are a bad thing. Not long ago I was in a plant where a steam engine drove a main shaft by means of a belt, the shaft running through a wall and carrying power into an adjoining room. It was a plain shaft, poorly aligned. The belt was tight and yet it slipped. It was a good example of a poor belt drive. The efficiency of that drive was, say, 80 per cent. From that shaft a second lineshaft was driven, the efficiency of which was, say, 80 per cent. A third shaft near the floor was driven from this second line shaft. We will again call the efficiency of that drive 80 per cent. Then came a belt twist for the purpose of turning shafting that was hung at right angles to the first shafting. The efficiency of this quarter-turn drive was, say, another 80 per cent. The power was then carried to another line shaft, and so on to the farthermost end of the room. I did not count the number of belt trains, but am sure there were at least eight and perhaps ten of them. In all my experience with belts, I do not remember seeing as glaring an example of wasted power through belts as I saw in this plant.

Assuming the efficiency of each unit drive to be 80 per, and that the number of units or trains is ten, we must multiply 0.80 by itself ten times as follows: 0.80 x 0.80 x 0.80 x 0.80 x 0.80 x 0.80 x 0.80 x 0.80 x 0.80 x ∪.80—0.107. In other words, the overall efficiency of the drive from end to end is less than 11 per cent., which is surely too low an efficiency to sanction, these days. One of the machines driven by the sixth train required about 20-horse power for its propulsion. After six trains it is easy to compute the efficiency of the transmission line to be about 25 per cent. The power generated by the engine to drive this machine was therefore: 20 divided by 0.25 equal 80 h.p. power.

Securing Greater Efficiency

Now, if a rope drive had been installed from the engine direct to this machine it would have been possible to negotiate the turn through 90 degrees and yet attain a much higher efficiency than 25 per cent. Let us assume that an efficiency of 80 per cent. could be effected with a rope drive of this kind. The power required of the engine would therefore be only 20 divided by 0.80 equal 25-horse power. In other words, the power saving would be 80-h.p. minus 25-h.p. equal 55-h.p.

Another way to surmount this evil is to install electric group drives. Let the engine drive a generator and then distribute the current to motors scattered her and there over the plant. The efficiency of the generator should be at at least 90 per cent. and the motor the same. The overall efficiency of the electric drive will, therefore, be very close to 80 per cent. From one of these motors one can therefore run a belt and get a high ratio to the driven machine.

Belt trains aren't so "terrible" where the machines driven at the end do not consume much power. But where the machine uses as much as the above machinery required, it is good engineering to get the power to the machine more efficiently—by a more direct route—mechanically or electrically. I usually advise using the mechanical method.

Suggestions for Aligning Shafting

To keep shafting aligned, one very good method is the "steel wire method." Stretch a wire from one end of the line shaft to the other, just beneath the line shaft. Then, by means of a plumb bob suspended from the shaft at various points, it becomes possible to align the shafting with great accuracy—horizontally—within 1-64 of an inch. To align the shafting vertically, a rubber hose, with a gauge glass inserted into each end, will serve the purpose very well. Fill the hose with water, maintain the level at a certain point at one end of the shaft, and then by moving the other end of the hose to the point to be leveled the proper elevation is easily determined.

How One Plant Increased Production

One of the interesting features in the plant of Lyon Bros. Toronto manufacturers of wood boxes for storage batteries, is the use of what is known as the " recessed head screw." These screws, which differ frrom the ordinary type in that there is a square recess in the head instead of the usual slot, can be driven with greater rapidity, and the driver is not liable to slip as is the case with the slotted-head screw. In this particular instance a Reynolds automatic screw-driving machine is used for sending these screws home. The accompanying illustration shows this machine in operation, with Mr. Lyons in charge. Mr. Lyons was quite enthusiastic with regard to the many advantages of the recessed head. The square on the driver fitting snugly into the head, enables the screw to be driven

Robertson recessed head screws being driven in battery boxes by Reynolds automatic screw driving machine.

straight and true, and the trouble experienced from slotted head screws splitting, is entirely absent. He says that its use has resulted in a marked increase in production.

An advertisement of Recessed Screws, Limited, Manchester, England, which appeared in a recent issue of the " London Daily Mail," gave an interesting outline of the development of wood screws. The earliest screw know was said to have been invented by Archimedes, 250 years B. C. As turning machines or lathes were not known at this date, the thread was formed by wrapping brass wire around the body of the screw. This was a blunt of square pointed screw and had a round head with a hole in it. It was driven by inserting a pin in the hole and thus revolving the screw. In 1775 an English inventor brought out what is coninserting a pin in the hole and thus revolving the screw like its ancient prototype, this also had the blunt point. It was not until 1850 that the modern or gimlet-pointed screw first came into use. Naturally the Recessed Screws, Limited claim that the latest development is their recessed head screw.

P. L. Robertson Mfg. Co., of Milton, Ont., who have the Canadian rights for this recessed screw, find that there is an ever increasing demand for this article. It is finding favour in many directions, being used in the furniture, woodworking and auto body manufacturing industries, and is used to a considerable extent in the electrical field. The appearance of the finished product is more attractive than where the old slotted-head type is employed. The claims put forward with regard to the use of this screw are that double the amount of work can be produced and that the quality and appearance of the article is improved.

The Trend of Wages During 669 Years

The table below was compiled from information gathered from the continuous record of accounts relating to the work on buildings in London for more than seven centuries, ome of which are Westminster Abbey, Westminster Palace, the Tower of London, Hampton Court, Whitehall, and Buckingham Palace.

It is claimed by the compiler (The Times, London, Aug. 31, 1920) that the lesson taught by this investigation is that wages when they have once risen never decline.

Rates per day in the building trades in specified years, 1252 to 1920.

Year.	Carpenters, masons, bricklayers, joiners.	Plumbers.	Plasterers.	Laborers.
	s. d. s. d.	s. d. s. d.	s. d. s. d.	s. d. s. d.
1252	0 2½	.. ..	.. ..	0 1½ .. ..
1253	0 3	0 3	.. ..	0 1½ 0 2½
1258	0 3½ 0 4½	0 3 0 6	.. ..	0 2 0 2½
1281–1284	0 5	.. ..	0 5	0 2 0 3
1285	0 4 0 6	.. ..	0 5	0 2 0 3
1287–1289	0 6	.. ..	0 10	0 2½ 0 3
1292	0 6 0 6	0 4	0 6	0 2 0 3
1323–1325	0 4 0 5	0 8	0 4 0 5	0 3 0 3½
1324–1325	0 4 0 6	0 8	0 4	0 3 0 3½
1361–1362	0 5 0 6	.. ..	0 5 0 6	0 3 0 3½
1400	0 5 0 6	.. ..	0 5 0 6	0 3 0 3½
1441–1442	0 6	0 4	.. ..	.. ..
1450	0 6	0 4 0 7	.. ..	0 4 .. ..
1494	0 6	0 6	0 6	0 3 0 4
1514–1515	0 6 0 8	.. ..	.. ..	0 4 .. ..
1516	0 6	.. ..	.. ..	0 4 .. ..
1530	0 6 0 8	0 8	0 7	0 4 .. ..
1533	0 5 0 7	.. ..	0 7	0 4 .. ..
1535	0 6 0 8	0 5 0 7	0 7	0 4 .. ..
1538	0 6 0 9	0 7	0 7	0 4 .. ..
1540	0 7 0 10	0 8	0 8	0 5 .. ..
1558	0 8 1 0	0 9 1 0	0 9 1 0	0 5 0 9
1559	0 10 1 0	1 0	0 10 1 0	0 7 .. ..
1567	1 1 1 2	.. ..	.. ..	0 8 .. ..
1578–1588	1 0	1 0	1 0	0 8 .. ..
1601	1 0 1 2	1 0 1 2	1 0 1 2	0 8 0 10
1603	1 0 1 4	1 0 1 2	1 0 1 4	0 8 0 10
1607	1 3 1 6	1 0 1 4	1 0 1 6	0 10 .. ..
1612–1613	1 3 2 0	1 4 1 6	1 0 1 6	1 0 .. ..
1621	1 3 2 0	1 4 1 10	1 6 1 10	1 0 .. ..
1639	1 10 2 0	2 6	.. ..	1 2 1 4
1646–1647	1 10 2 6	2 6	2 0 2 4	1 2 1 4
1660	2 0 2 6	2 2 2 6	2 4 2 6	1 4 1 6
1667–1668	2 0 2 6	2 6	2 6	1 4 1 6
1677–1678	2 6	2 6	2 6	1 6 2 0
1686	2 6 2 8	2 8	2 8	1 8 2 0
1699	2 6	2 6	2 6	1 8 .. ..
1778	2 6 3 0	3 0	3 0	1 8 1 10
1788	3 0	3 0	3 0 3 6	1 10 .. ..
1790	3 0	3 0	3 0	1 10 .. ..
1794	3 4	3 0	3 0	1 10 .. ..
1796	3 4	3 0	3 0 3 6	1 10 2 3
1797	3 4 3 8	3 0	3 6	2 3 .. ..
1801	3 8 4 5	4 0	4 4 4 6	2 5 .. ..
1803	4 9 5 0	4 0	4 6	2 5 .. ..
1808	4 10 5 0	4 6	5 6	2 5 .. ..
1826–1847	5 0	5 0	5 0	3 0 .. ..
1853–1861	5 0	5 0	5 0	3 0 .. ..
1861–1865	5 10	5 10	5 10	3 6½ .. ..
1865–1866	6 3	6 3	6 3	3 9 .. ..
1866–1872	6 8	6 8	6 8	3 11½ .. ..
1872–1873	7 1	7 1	7 1	4 4½ .. ..
1873–1878	7 6	7 6	7 6	4 9½ .. ..
1914	9 7	10 0	9 7	6 8 .. ..
1920	23 4	23 7	23 4	20 10 .. ..

Testing Strength and Serviceability of Boxes

Outline of Methods followed in Testing Boxes for carrying Macaroni and Similar Products — Indicating how Strength could be Increased.

By Don L. Quinn, Resarch Dept. Chicago Mill & Lumber Co., Chicago.

A number of the Consolidated Classification Committee sent a request to the National Association of Macaroni Manufacturers, asking that specifications be submitted covering a box suitable for packing macaroni and similar products, which would tend to reduce the transportation losses. To this end, a series of tests were made to determine the reason of the failure of so many boxes while in transit, and to prepare specifications that would ensure a box sufficiently strong to withstand ordinary handling and transportation hazards.

The tests were made in the box testing laboratory of the Chicago Mill and Lumber Company in Chicago, with the object of measuring the strength of wood boxes used for carrying bulk macaroni as compared with wood boxes used for carrying other commodities, and to measure the value of different thicknesses of lumber in comparison with each other. Investigation of those boxes was also made in macaroni plants and in transpotration in order to confirm the laboratory conclusions.

Method of Testing

Two methods of testing these boxes were followed—the compression test and the revolving drum test.

A compression test is, as its name implies, a constant and steady increase of pressure measured in pounds applied to one corner or edge of an empty box, with the opposite corner or edge, diagonally through the box, in a direct line with the pressure exerted. The amount of pressure required to collapse the box is the measure of its strength against such hazards of transportation as could cause such failures. For instance, the box in the bottom row of a pile in a moving, swaying, jerking freight car is subjected to just such strains.

In the drum test, on the other hand, the box was packed with bulk macaroni, just as in actual service. The drum has six sides and slowly revolves. Inside the drum are hazards so arranged that, as the drum revolves, the box is made to fall in a more or less regular cycle on ends, sides, top and bottom; on corners and on edges until it breaks up and spills the contents.

The number of falls the box withstands before it fails and lets its contents out, is the measure of the strength when subjected to rough handling. Necessarily, if one kind of box will withstand fifty falls before breaking up, and another will withstand one hundred similar falls, it follows that the latter is twice as strong in so far as carrying that particular commodity is concerned.

These two tests permit an exact comparison of the serviceability of boxes of different specifications. Studies made under actual transportation conditions confirm these conclusions, for boxes fail in actual service in exactly the same way they fail in these tests.

Discussion of Compression Test

In the compression tests, three series of tests were made, ten boxes in each series. The lightest boxes in common use, having 7-16-inch ends, and ¼-inch veneer sides, tops and bottoms, made of gum wood, were tested first. They were nailed in accordance with the nailing schedule compiled after a long series of tests in the Foerst Products Laboratory of the U. S. Forest Service and officially adopted by the National Association of Box Manufacturers as their standard. It required 387 pounds under diagonal compression to cause these boxes to collapse. (I will explain a little later the significance of these figures.) The typical failure was in the splitting of the ends, which means that the ends were not as strong in resisting compression as the quarter-inch sides, tops and bottoms.

Ten boxes, having the same 7-16-inch ends and ¼-inch tops and bottoms, but with 5-16-inch instead of ¼-inch sides, were then tested. It required an average of 430 pounds to crush these. The heavier sides evidently tended to reinforce the thin ends of these boxes. These were 11 per cent. stronger than those tested in the first series. In this second series, as in the first, the typical failure was splitting of the ends.

In the third series, ten boxes having ½-inch gum wood ends and ¼-inch sides, tops and bottoms, were tested and then withstood an average 502 pounds before collapsing—30 per cent. stronger than those of the first series. In this series, as in the other two, the typical failure was in the splitting of the ends. In other words, the ¼-inch veneer sides, tops and bottoms were, in most of the 30 boxes, in good condition at the time the ends split.

Increasing the thickness of the ends from 7-16-inch to ½-inch added only 30 per cent. strength—not enough, in fact, to justify a change to that construction. If additional strength be necessary, the thickness of the ends would have to be increased beyond ½-inch, if any materially increased serviceability were to result.

We contend an average of 387 pounds in diagonal compressive strength is a great deal more than those boxes need in service. Other tests show that a box which will resist approximately 400 pounds in diagonal compression requires that at least 1,200 pounds be piled directly on it, and then be subjected to stresses similar to those it would get in a pile in a jerking freight car before it would collapse. That is at least three times as much weight as macaroni boxes could reasonably be expected to carry when loaded in car lots, and certainly is as much weight as should ever be piled on them in a local freight car if the railroad employees use any judgment whatever.

Discussion of the Drum Test

The boxes tested in the revolving drum corroborated the result of the compression tests. These boxes were made of 7-16-inch ends and ¼-inch veneer sides, tops and bottoms of gum wood. We used standard egg case nails, because of their large heads. These nails, in length, are 3d size. Each box held 22 pounds of bulk macaroni. They averaged 31 falls before breaking up and spilling their contents.

Now, 31 falls in that big iron drum machine are a great many falls. For instance, we have tested hundreds of canned food cases of the best construction

in common use, and their average, under the same falls, is much less than 30. We have tested hundreds of cases such as are in common use for carrying other similar commodities, and in the same machine they average less than ten falls before breaking up —one-third the serviceability of these light macaroni boxes. Many other tests of a similar nature on varying products gave us other data with which to compare these results, and upon which to base our judgment as to the proper measure of serviceability.

But you ask: If that be a true measure of their strength, why the complaint from the railroads? The reason was plain enough when we investigated the boxes in the plants of macaroni manufacturers. We found that a great many boxes were made of mis-cut parts. The most common fault was ends cut from 1/4 to 3/8 of an inch too narrow or else they had been made of green lumber and shrunk that much. We found ends that were of the correct width at one end and 3/8 of an ich scant width at the other. When nailed up, the sides extended beyond the edge of the ends, so that when the top or bottom was nailed on, that caused the top or bottom to split at that edge. Veneer is frequently cross-grained, so under rough handling, that split immediately extends across the board, lets a part come loose and the macaroni falls out. Without doubt, that was responsible for more loss and damage claims than any other single cause. Of course, the fault lies with the box manufacturer. It is his duty and obligation to furnish the material cut true to size and proportion. Under the usual conditions of manufacture, he meets that responsibility to the fullest extent—at least the thoroughly reliable box manufacturer does.

The other glaring fault we found in macaroni plants was the naiilng. Sometimes the right number of nails were used, but they varied in size from 3d to 5d. The 4d and 5d nails are too large. They start a split in the ends before the boxes are packed. The heads of the 3d nails are too small. They have very little grip on the material under the nail head. I suspect this nailing was responsible for more loss and damage claims, under normal conditions, than any other single cause, and was second in importance under the abnormal conditions of the past few years.

Lesson to Be Learned

The conclusions are obvious. The box manufacturer is in duty bound to furnish you with properly cut materials. He sells you such, and he expects to make that delivery. It costs you no more to get properly cut materials under normal conditions, and normal conditions of manufacture now prevail. Of course, it is your duty to demand good material and then to see that you get what you demand. It is your obligation to nail right. The manufacturer may furnish the highest grade material, but unless the parts are well nailed the box is not good. By nailing right, we mean to use the right number and the right size nails. We recommend the standard egg case nail, because of its large head. It is standard 3d in length and gauge and has a head equal to a 5d box nail. The nails should be spaced 1 3/4 inches to 2 inches apart; the closer the nails are spaced the greater the serviceability of the boxes. The large head gets a good firm hold on the thin boards on the sides, tops and bottoms, and that counts for much in holding those parts together. These nails are a standard manufacture; are listed at 15c per keg advance over 3d nails, are cement coated, and there are more nails per keg. They can be procured from the usual sources of supply.

These two factors, together with the more normal transportation conditions, should give boxes of proper serviceability. They should satisfy the railroad people. No necessity exists for specifying wood boxes of any stronger construction than is in common use to-day. They have ample strength for usual transportation conditions, and they have enough additional strength as a factor of safety to satisfy any reasonable requirements.

Manufacturers of macaroni, who use wood boxes, certainly have little cause for complaint because of these obligations. All that is necessary is that they exercise the proper degree of supervision over the quality of the box materials they buy, and then see that those materials are nailed together properly. It certainly is a light responsibility. Think how bothersome it would be if you were packing Mazda lamps, for instance, where the value of each item is big, and the liability of damage is in the delicate filaments. That responsibility was met and overcome by the manufacturers of those lamps through laboratory tests and studies, similar in every respect to those I have described.

Going to the opposite extreme, the manufacturers of computing scales were confronted with the necessity of protecting frail castings and delicate agate bearings and sharp knife edges. They met that responsibility likewise through similar box laboratory tests and studies, and are assuming that responsibility, and reducing their loss and damage claims accordingly.

Loss and damage claims paid by the railroads jumped in four years from about 35 million dollars per year to about 110 million dollars. A necessity exists for reducing those rapidly mounting claims, and each of us, the box manufacturers, the shipper, and the carrier, has his share in that responsibility. Neither one alone can do it all. Each has a part to perform. Their interests are not antagonistic, they are very much interwoven. Working together, doing his part, assuming each his own fair share of responsibility, those claims will be rapidly reduced, and all will be better off because of it.

Gas Being Made from Wood instead of Coal

Gas made from old oak logs is now being supplied successfully to the inhabitants of Steyning, a town in the county of Sussex, England. Other towns are rapidly following suit. It is claimed that this wood gas has practically the same heating and lighting properties as coal gas, and its use means a saving of more than half a dollar per 1,000 cubic feet to the customer.

The Steyning gas works being threatened with closure owing to the prohibitive price of coal, about $25.00 a ton, the carbonization of wood was resorted to as an experiment, with the result that wood gas has been definitely adopted as an illuminant until the price of coal comes down.

At Birmingham, old road paving blocks have been converted into wood gas with equally satisfactory results.

It is better to run a wide belt very loose than a narrow one very tight. The first is easy on the bearings, and the second wears them out in record time.

Upholstering and Trimming

Modern Upholstering

Successive Steps in Building up Foundation for Soft, Downy Upholstering. Special Methods Followed in Modern Practice

(Continued from July Issue)

The next step is the formation of the nosing, which may be made in two ways. When referred to as a " nosing," it means simply that a roll is built up on the rail itself, as in cross-section Fig. 8-A; when it extends back to a point even with the springs, we will refer to it as an " edge."

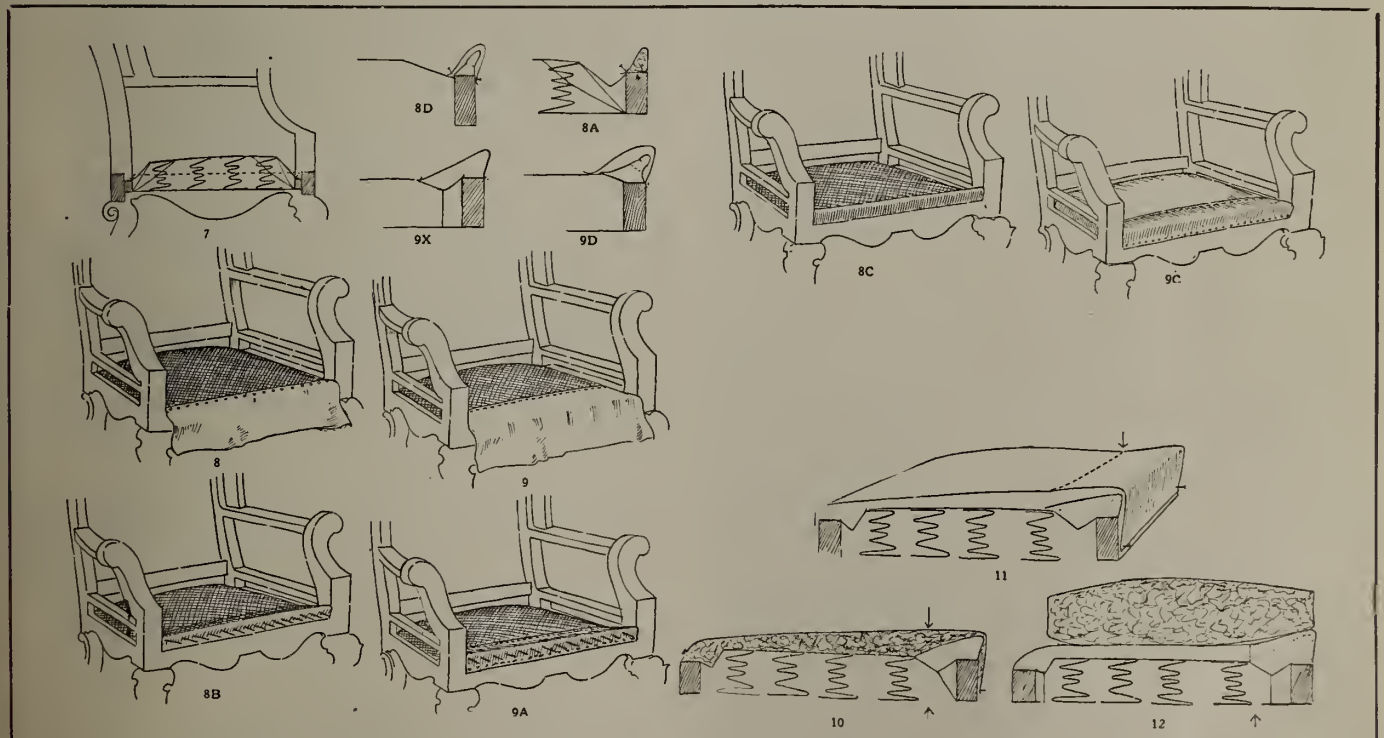
Fig. 8 shows the first step in forming the nosing. A strip of canton flannel is back-tacked to the front of the rail. This strip is filled uniformly with hair so as to produce a fairly compact roll, and the back edge is tacked to the back of the rail, as indicated in Fig. 8-A, a cross-section sketch. This nosing is given a single straight stitch after the manner of a regular stitched edge. See Fig. 8-B. When the canton flannel is carried back onto the springs, it is stitched to the spring canvas, as indicated by Fig. 9. This is stuffed into a regular edge, but kept low, and shaped to about 1½ inches high in front, as shown in the cross-section Fig. 9-X. The stitched appearance of this edge is illustrated in Fig. 9-A, while Fig. 8-B shows the stitched appearance of a nosing, the front view really appearing very little different, except that the nosing, being low, requires practically a straight stitch.

Covering the Nosing

The next step in the treatment of the seat is to cover the nosing with a layer of hair. Another strip of canton flannel is back-tacked to the top of the front rail, and carried back and tacked, if a nosing, or stitched, if an edge, so as to make the finished foundation, as illustrated in Fig. 9-C and cross-section 9-X(the stitched edge, covered, and Fig. 8-C and cross-section 8-D, the nosing covered.

A light layer of hair is now placed over the spring canvas, and a covering of muslin is drawn over this hair pad and slip-tacked into position, the cross-section of the chair appearing like Fig. 10. Then, at a distance of about three to four inches from the front edge, a line is drawn on the muslin, as indicated in this figure by an arrow, and on this line the filling and muslin are stitched through and through. (See Fig. 11.)

It should be borne in mind that the object of the nosing or stitched edge, and the stitching of the muslin, which we have just described, is all to provide a base which will allow for the ultimate shape of the down cushion, which is always thicker in the middle than at the edge, and the foundation must be made concave to allow for the convexity of the cushion. This is best explained by a reference to Fig. 12,



Details for building seat foundation

Successive Steps in preparing Back

which shows the cross-section and contour of the muslin foundation and the cross-section of the down cushion.

After the muslin has been stitched down, as indicated by the arrow on Fig. 11, the edges are tacked all around and the foundation is finished, ready for the covering.

The seat of the chair, having reached the stage where it is in muslin, is preferably left in this condition while the balance of the chair is brought up to the muslin stage. The back is, therefore, next to be considered.

Springs for Soft Back

In connection with the chair under consideration, there are two ways of upholstering the back, either with springs, as shown in Fig. 15, or as a plain, softly upholstered pac-back without springs, which will be described a little later in connection with Figs. 29a and 29b.

To produce the softest form of back, it is necessary to use a foundation of springs, and these must be kept quite low, it being sometimes necessary to cut a pillow spring in half in order that the upholstering of the back shall not be too thick.

The first stages of the upholstering of the back of the chair we are describing are illustrated in Fig. 13. A thickness of canvas is stretched over the entire outside back and across this four strips of webbing are stretched and tacked, as indicated in the figure just mentioned. This provides a foundation for the springs, eighteen in number, which are placed as indicated by the crosses in Fig. 13, and by the circles in Fig. 14. The springs are sewn to the canvas by four stitches, preferably knotted as shown in Figs. 14a and 14b, after which they are tied down in the regular way, as shown in Fig. 15. A layer of canvas is next placed over the springs and tacked. The springs are sewn in this canvas covering also by four knotted stitches, as shown in Figs. 16 and 21a.

Building Up Edge

The next step, following the appearance of the chair in Fig. 16, is to provide the top edge of the back with a roll similar to the edge or nosing which has been placed on the front of the seat, described in earlier paragraphs. This edging is built up something like the nosing illustrated in Figs. 8a, 8b, 8c, and 8d, and is really a nosing, in that it is built up on the frame of the chair and is not sewn in the spring canvas. The flannel for this nosing is back-tacked on the top edge of the chair, as described for Fig. 8.

It is filled to a compact consistency with hair, tacked into position and stitched to form the shape indicated in Fig. 20 and in cross-section Fig. 20a. The reason for back-tacking the flannel which forms the nosing on the edge of the top rail is that allowance is thus automatically made for the swell of the curve, and fullness is disposed of.

The next step is the laying on of the hair covering, which may be done in either of two ways: by the bridling method, shown in Fig. 17a, and by the stitching method, shown in Fig. 17b. The bridling method consists, as will be observed in the figure mentioned, 17a, of having long stitches of twine

caught at intervals in the canvas, at a distance of about six inches from the outside edges of the back, also criss-crossed across the back.

Placing the Hair

The hair, already picked out so as to be free from lumps, is inserted beneath the twines in a compact mass, and woven together during the insertion by manipulating the fingers. (See Fig. 17c.) Over this another smooth layer of hair is worked into the first coating, so that the entire mass will be of the same thickness and consistency, after which a covering of muslin is drawn over and slip-tacked into position, as Fig. 18.

The other method of placing the hair, indicated in Fig. 17b, does away with the bridling twines. The hair is laid on the back to the required thickness and stitched through the canvas by long stitches which prevent the hair from slipping out of place. The softer the upholstering, the greater the necessity of the twines, which hold the first layers of hair in place, independent of the coverings.

After the muslin has been slip-tacked all around, as indicated in Fig. 18, it is again very carefully and permanently tacked, covering the wood frame of the chair if it is to be shown for display in muslin, but not necessarily so carefully covered if it is to be sold in the cover.

Fig. 21 shows a vertical cross-section of the back as completed in the muslin.

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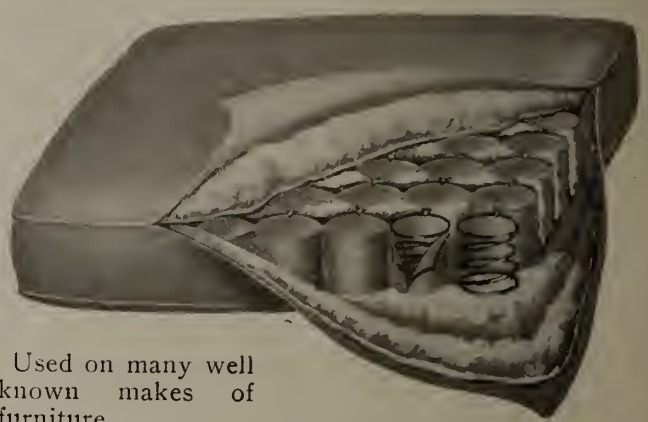

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Finishing Decorated Furniture

Demand for Decorated Furniture on Increase—Development of Enamel Finish—Requires Artistic Ability of High Order

To convey to the mind what is covered by the term "Decorated Furniture," it becomes obvious that we must cover enamel, enamel decorated, parchment, and polychrome furniture, says W. K. Schmidt, in the Furniture Manufacturer and Artisan. That the present day decorative work is a refinement of the heretofore enameled furniture can readily be understood. Enameled furniture was usually made with two undercoats, two coats of colored enamel put on in various harmonious shades with moulding trimmings, artificial carved decoration and usually rubbed finish. That beautiful results were obtained, we all know; that the extremes were modified, and that the decorations have passed through the ornate to the dignified. We still see real hand painted decorations in the shape of views, scenery, and figures, but mostly is the relief obtained by the decoration of the carving. This verges very much on polychrome in many cases. One might say a "modernized polychrome" effect.

All manners of ideas have been carried out on the mouldings, such as an undercoat of bronze, over which the color scheme has been worked and wiped off, permitting the bronze to show through the various portions of the moulding—the same as highlighting old ivory only getting brown tones in the recesses. The trimmed color being in the recesses brings decorated furniture to its present day standards and the work of quality is done by hand painted decorations which are laid under the finish and thus are protected against the rubbing and wear.

Very Attractive Results.

It is most difficult to produce a word picture that will correctly convey the beautiful results thus obtained. After a good ground coat has been produced—a perfectly smooth finish—the decorations are done by hand and consists in many cases of conventional designs, many of them of the Japanese theme, others of leaves and flowers. In many cases the top of a table will have a modeled parchment effect with an absolutelyplain off-set color in soft tones of blue or browns, harmonizing with the shades of the parchment. This parchment effect is produced in many ways. Imagine tiffany wall paper with its soft shades of brown rubbing into the lighter shades of orange, buffs and the like—one continuous wave of harmonizing colors without a definite design whatever. Then imagine this same color scheme done with a brownish black ground, but finished with a dull brown effect. It takes an artist to do it with a brush, but the clouding effect is easily produced with small spray. This same effect is carried out in any shade that the eye may conceive but always done in harmony. As stated this may be the border effect, or it may be the center effect. The center may be of a dull blue with a gold parchment border and again this parchment border may be decorated with design or flowers. Still another idea is to get what is known as an "autumn of brown"—brownish orange with leaf work on the table legs and chair legs, which again may carry a small decoration; but the one point that takes this modern day decorations away from its predecessors is the fact that the final finish is absolutely smooth and that the decorations are under this final fiinish, and hardly show a raised portion where the decorations are applied. This of course is accomplished in different ways, some using transparent shellac that has been clerified by filtering, and then rubbed flat or a thin, very transparent varnish, one that sets up well, gives a hard coat and will rub flat easily. Others prefer a wood lacquer, which gives the transparency desired and the finest film possible but assures a moisture proof surface, as well as a heat resisting coat. It requires experience, so as to avoid a disturbing of the hand decorations and still give an absolute transparent finsh which leaves the appearance of being a part of the entire finishing process. Finally the entire piece is rubbed dull.

Distinct from Polychrome.

It at once becomes necessary for those undertaking the manufacture of decorative furniture to maintain their designs in color schemes other than those of the polychrome style. We stated that many of them verged on the Japanese, this from the fact that in factories where Japs are doing the work, they are attempting to get American ideas into their decorative schemes In factories where Americans are employed it is presumed that they in turn get some of the Jap's ideas of decoration and thus it becomes a composite all the way through. Beautiful conventional designs are obtained from art journals, in which color plates appear and many of them have proven regular panaceas for the decorator who is always groping around for new ideas.

Another point the decorator of this kind of furniture should avoid is that of smutting his colors or designs. That would be conflicting with polychrome finish, and it is desirable to have both of these styles of decorative art go along on the distinctive lines rather than to be come ntermingled and thus lose their distinctiveness.

We have stated that the better grades of decorated furniture received a final coat of wood lacquer, and therefore we can say that as regards water resisting qualities, a lacquer film compares very favourably with out door spar varnsh. A panel to which three coats of lacquer were applied with spray, did not show a greater passage of moisture through the film by complete immersion in water over a period of ten days, than a similar test with spar varnish. Lacquer films show great resistance to heat. A film rubbed vigorously until heat unbearable to the touch will show no signs of gumming up. In this connection it might be stated that upon at least two days drying after the

final coat of lacquer the film is sufficiently hard as not to appear marked.

Suggestions to Follow.

The entire scheme of decorative furniture, one can readily see, carries with it the process or the art of enameling furniture to a more or less degree of perfection before decoration is undertaken. By enamels the furniture manufacturer as a rule understands a product whose vehicle consists of oils, varnish, and dryers of various kinds. We were fortunate in obtaining some technical notes on lacquer enamels which offer advantages and which will appeal to many owing to these advantageous qualities. Unlike the old style enamels they give a harder surface and results are obtained in a shorter time. Therefore the following pertinent facts are well worthy of consideration. The following being an extract from a laboratory report:

"For enamel finishes wood should be prepared by applying one or two coats of a combination filler and surfacer, the number of coats depending on the nature of the wood. For this work a lacquer pigmented surfacer is preferred over an oil surfacer for the following reasons: Has greater adhesion; presents a harder surface; can be applied and dried in three to four hours ready for enamel coat as against 20 to 30 hours for oil surfacer; being closely allied to lacquer, enamels require less enamel coats and enamel adheres better to it; no sealer is necessary over lacquer surfacer to serve as protection against action of enamel, the enamel tending to blister the oil surfacer.

"Oil surfacers are very soft and chalk readily. In deep groves they bridge when enamel is applied due to contraction of the enamel film and lack of adhesion of the surfacer. Oil surfacers can be used to advantage in end wood and pitted surfaces after which the lacquer surfacers should be applied.

"For spraying, lacquer surfacers should be thinned 30% using 50 pounds pressure.

"Oil surfacer, thinned 50 to 50 with 30 pounds pressure, for deep corners larger quantities of thinner should be used. After sanding for leveling and smoothing surfacer, enamel is applied. Enamel to be thinned 20 to 30% using 50 pounds pressure.

"Over lacquer surfacer only one or two coats of enamel are necessary, whereas two or three coats of enamel are necessary over oil surfacer, on account of the color and softness of the latter.

The first coat of enamel will attack the oil surfacer forming blisters which have to be sanded down. The second and third coats of enamel will insure a hard surface in case the oil surfacer is used. For the lacquer surface only a color surface is necessary. In case of flat enamels buffing is necessary for gloss if gloss is desired. Lustrous enamels can be used as a final coat to eliminate buffing. Time of drying between coats holds true with enamels same as with lacquers, two or three hours. Spray should be regulated and operated in the same manner.

"For metal parts oil surfacer is desirable for filling the pores and levelling off. Lacquer surfacer is too hard and brittle for this purpose, but can be used over the oil surfacer as a hardening coat and preparatory coat for enamel. Otherwise a sealer is necessary in some cases between surfacer and enamel coat to prevent enamel attacking surfacer.

"Very often an intermediate thin coat of shellac is necessary for adhesion to enamel. Other details for metal finish are the same as for wood."

We have not touched upon the kind of wood to employ. This is a matter entirely up to the manufacturer, but it is our conviction that in many cases not enough attention is given to the wood in the belief that enamel process covers a multitude of sins, and sins they truly become, where too soft woods are employed. The enameling process should always carry with it the idea of producing the finish so that the successive coats are bound thoroughly to the wood and will not chip off, for it is almost impossible to do a respectable repair job on faulty enameled work.

The Keeping Properties of Finishing Materials

Finishing products are manufactured on principles that require them to be used within a reasonable length of time. However, there are instances of varnish, etc., being kept for forty years and upon the container being opened, the contents were found to be in practically the same state as when made, and careful consideration of the following facts will enable the finishing room department to keep materials, so that they will be kept in a proper state for a considerable length of time.

In practically all finishing materials there are two conditions that affect the quality of the goods, namely, evaporation and oxidization; and these two conditions naturally play a large part in the final use and durability of the products, as both of these conditions go to make the products dry; consequently, the longer the air can be kept away from the product, the longer it will keep. Cork is the usual medium for filling the openings, but is more or less porous, and will (after a period of twelve months) go to pieces. However, it can be kept in its proper state by the liquid in the container coming in contact at all times with the cork. This is the reason why the manufacturers (in times past) of expensive wines, made a rule to have all bottles laid down on their side, thus enabling the cork to be at all times saturated with the liquid, thereby insuring a perfectly air-tight container.

With all stains and other liquids, it is necessary to shake the contents (or in other ways agitate the contents) in order that there may be perfect uniformity with all the different vehicles or solvents contained therein. This agitation is absolutely necessary, whenever a pigment is incorporated into the vehicle.

The incorporating of pigments into liquids in many cases has to be done by the user, in such instances as paste wood fillers, and enamels, in which are such pigments as heavy oxides, as it is impossible to prevent the settling of these heavy pigments into the bottom of the container, which will form a hard cake or mass, which cannot again be put into solution by the agitation; consequently, many such articles are put out by the manufacturer in a paste form, which have to be reduced by the user.

The containers in which finishing room products are sent out, are governed to a large extent, by the length of time which the products can be kept. Containers, such as cans, steel drums, earthenware jugs and glass bottles are very satisfactory mediums for the keeping of any material a long time, as such materials as mentioned above are perfectly airtight.

The woden barrel, however, is of a necessity, more or less porous, and is always subjected to the climatic changes which will expand or contract the staves of the barrel, consequently causing leakage, which is a condi

tion that practically every finishing room foreman is aware of; therefore, the storage of wooden barrels must be carefully guarded, so that they will be kept in a place where the temperature and humidity will be more or less constant.

A customer who is using goods about one hundred (100) gallons per year, should at all times buy his products in one or five gallon cans, taking from same just sufficient to finish up his work, and keep the containers as free from air as possible. This applies, of course, to the filled containers, as well as to the partly filled containers.

Slow drying stains and varnishes, etc., are not affected by evaporation and oxidization as much as the fast drying varnishes and stains are. Most varnishes will skin over (which is due to the oxidization of the oil) and this skin must be all removed before proceeding to stir up the liquid.

Shellacs, substitute shellacs, spirit copals, and other liquids containing alcohol, should not be allowed to stand longer than two or three months in a tin container, as otherwise they will turn black. This action of turning black also applies to tin containers, when any liquid of an acid nature is put into them, and it is advisable, where the product is known to contain alcohol or any acid, to put them as soon as possible, into wooden or earthenware containers.—"Finishing Facts."

"Mouthpieces of Commerce Department."

An official and generous recogntion of business and technical newspapers as essential factors in modern commerce and industry has been given by Secretary Herbert Hoover, of the Commerce Department at Washington.

One of the first steps taken by Mr. Hoover, after he was installed as head of this important department was to invite the heads of the leading business and technical newspapers of the United States to meet him in Washington to discuss with them the problems of his department. Sixty-two men accepted the invitation, and at this meeting Mr. Hoover gave evidence of his high appreciation of the value of the business and technical press by saying: "My view of the matter is that we may well consider the trade publications of the country as the mouthpiece of the Department of Commerce—the contact points by which the business world is to know what we are doing and how we are doing it, and also to carry our industry this message of co-operation which it is my hope to place before every manufacturer in every industry in the country."

As an outcome of this initial conference a monthly meeting has been arranged and every month since, Mr. Hoover has held conferences with these publishers. He has frankly admitted that the meetings with the heads of business and technical newspapers are of material benefit to him. He needs the close-up view of business and industry which he can get from those men—as he can from no other source.

The minister in charge of the Canadian Department of Trade and Commerce might profit by this experience of Mr. Hoover, and summon to his aid the heads of business and technical newspapers in Canada. A conference with these men wuld give him some vitally important information about trade conditions in Canada, which, it is safe to say, he does not possess at the present time.

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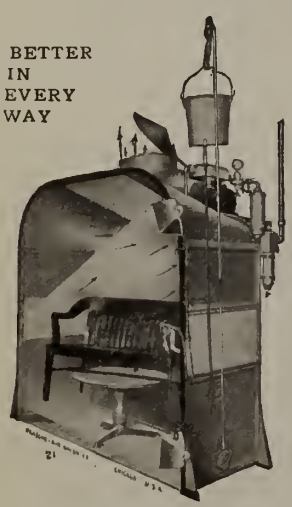
These are the findings of manufacturers who dispensed with old time hand brush methods. Regardless of your product you will find

BETTER IN EVERY WAY



Finish With Air Instead of Hair

In hundreds of leading furniture woodworking, piano cabinet plants Paasche Equipment is more than "making good" every work day in the year.

Most efficient and economical air finishing system known. One of our many popular (completely equipped) air finishing outfits as used by furniture plants everywhere. Made in various sizes to meet all needs. Applies liquid materials —all kinds.

Paasche Superior Finishing Equipments

Better—Quicker—Cheaper Way to Finish

How many pieces can you finish by hand per week? Multiply by 5 to 8 and you'll get an idea of the importance and value of Paasche equipment to you.

You cannot figure Paasche equipment as an expense—It is AN ASSET and A NECESSITY.

Investigate:—It will pay big returns on the investment.

Intelligent service rendered with each installation.

Write us to-day.

This Most Efficient Air Rubbing Device

It Means Better—Smoother—Quicker and Cheaper Work. Eliminate the Hard Fatiguing, Hand Rubbing Method and operate your Finishing Department on a Strictly Efficiency Basis.

RUBS AS EFFICIENTLY AT 4 P.M. AS AT 8 A.M.
Girls Can Operate Them

Paasche Air Brush Co. 1223 Washington Blvd., CHICAGO

Paasche Portable Painting Outfits are extensively used for Painting Interiors and Exteriors. Ontario Rep.: R. S. Pollard, Preston, Ont.

PAINT THE INTERIOR OF YOUR FACTORY in the same modern, improved and speedier way that the manufactured product is finished.
While clean, light reflecting walls insure increased efficiency and improved production, the use of

DeVilbiss
Spray-painting System

insures more thorough, longer wearing and cleaner painting at a lower cost.
The average speed of spray-painting with the DeVilbiss outfit is 5 times that of the brush method. Any kind of paint can be applied on any kind of surface, outside as well as inside.
Let us mail you the complete facts.

The DeVilbiss Mfg. Co.
3718 Detroit Ave. Toledo, Ohio, U.S.A.

Particulars about DeVILBISS EQUIPMENT for the finishing room will also be sent if desired.

Triple the Output of your Finishing Rooms.
Decrease the Congestion in your Factory.
Reduce Investment of Goods in Process.
Improve working conditions for your employes.

H O W?

By installing a

Nichols Varnish Drying Equipment

Which will pay for itself in one year or less

Furniture, pianos, talking machine cabinets, automobile bodies, etc., turned out in as many days as it formerly took weeks. Better finish, scientifically dried from the inside out.

We will analyze your particular conditions and submit proposition on an equipment, which, from our extended experience, we know will save you time and money, as well as improve your product. We solicit your inquiries covering any drying problem.

A. S. Nichols Company

Aeolian Hall, 33 West 42nd Street, New York City

Manufacturers of dryers for lumber, veneers, glued stock, varnish, paints, enamels, etc.

Buy and Build for the Future

The woodworking industry to-day is hungry for quality service. The manufacturer possessed of vision, builds for the future, and ensures his business by a consistent supply of high grade veneers.

There is beauty and permanence in our

Rotary Cut Veneers, Birds Eye Maple, Plain Birch and Maple Veneers

The present prices—the quality of our product—the prompt efficient service, these are good reasons why you should buy now.

Birds Eye Veneer Co.

Escanaba - Mich.

BeVeCo VENEERS

Veneers and Panels

Science of Moisture Control

Working Toward Definite Objective—Controlling Drying and Storage Conditions—Immense Savings may be Effected.

By J. F. Hirt, Forest Products Engineering Co., Chicago.

Another important factor in our favor is the time required for the finished product to imbibe or give up moisture. A carload of carted panels could ordinarily be in transit for a year or more without any ill effects if they have been treated in accordance with definitely known conditions and correct practice. The reason for difficulties on this score are obviously due to a lack of comparison of conditions in the plant of the veneer and panel manufacturer and his customer, and an effort to reach a satisfactory mean E. M. C.

Panels, because of their constructions of plys at right angles, set up opposing forces that assist geratly in retarding expansion and contraction.

The same does not apply with veneers and, therefore, greater accuracy in controlling moisture and more care in shipping should be exercised. In packing high-grade figured veneers, especially crotch stock and burls, it may be advisable under some extreme conditions to use a wrapping of waxed paper.

Packing veneers under pressure is another way to decrease moisture attraction. A simple hand-operated plunger press constructed in your shipping department would not only accomplish this, but at the same time would reduce your crating costs. The crates are filled under the raised plunger of the press. The plunger is slotted to receive the top slats of the crate so they can be nailed in position while the pressure is on. This method can be used in crating rotary core stock, cross-banding, backs, and dimensioned face stock, but would not apply quite so well in crating sliced logs and sawed flitches.

Other practices tending to assist in relieving the natural contraction and expansion of wood are in a state of development at the present time, but at best none of them promise to do any more than to contribute in a measure to the full solution of the problem which brings us back to the point of finding our E. M. C. and governing our product accordingly.

The Drying of Veneers

One of the most helpful and least costly methods of controlling moisture is the proper arrangement of material storage rooms. This is a matter that has had little attention by both the veneer and panel manufacturer, and a brief resume of what commonly occurs in drying and shipping veneers might be interesting.

The veneer manufacturer may be using any of the present commercial types of dryers or even the old style kiln or dryhouse in which he piles racks, or hangs the veneer. If he is using the former, he may succeed in bringing his veneer out of the dryer in a straight condition, but the stock very often contains an unknown quantity of moisture. If an effort is being made to dry it to a definite moisture per cent., the calculations on which this is based are sometimes incorrect. At any rate, the veneer is seldom at a moisture content in equilibrium with the air when it leaves the dryer and, therefore, it will either give up more moisture and shrink, or it will imbibe moisture and expand; in any case this "working" will not be evenly distributed over the surface of the sheets and local expansion, or "buckling," will result. If the stock is piled on trucks and rushed into crates, it will perhaps remain fairly straight until received by the customer.

In case the more obsolete equipment is used, it is impossible to dry the stock flat and very often without severe checking. What is still worse, an effort to dry to the correct moisture content is very seldom made. Usually the stock is said to "look and feel" dry, and the manufacturer consoles himself with the thought or expression that it is as good as his competitors are doing anyway, which is an assumption that may apply less generally in the near future.

Care in Handling and Storing

At our next observation we find the crated veneer or bundled flitches being unloaded at the customer's plant. We often see oak flitches thrown on the factory floors without even making any effort to control the moisture. Crated stock, as well as the veneers, are often dumped into a cool, damp basement, so that even if the stock had been dried correctly by the manufacturer, it would again imbibe moisture with the results previously explained. Then the customer redries the stock when he is ready to put it into panels. Here again he reduces the moisture content to the unknown quantity. To overcome the mistake of incorrect drying at this point, the stock is rushed right through the jointing, taping, and joint gluing operations into built-up bundles, when the veneer is considered quite safe, at least from "buckling." If something happens during this regular process, the taped-up veneers often take on enough moisture again and buckle so badly that they must be straightened out. In this event they are again redried to the same unknown condition, which is usually too dry, and then the regular process is again carried out.

In drying veneers the general assumption seems to be that the chief requisite is to get them sufficiently dry. This is decidedly wrong, as just as bad as not dry enough, providing the moisture has been reduced below the danger of mould. Without losing sight of our objective, I would like to point out right here one of the great sources of lost energy and money which is contributed to jointly and perhaps equally by the veneer and panel manufacturer. It is not uncommon to find veneer manufacturers loading

their logs to the limit of moisture they will hold in preparing them for the lathe or slicer through either one of the two methods: boiling or steaming, at atmospheric pressure. The procedure is then to dry them far below the E. M. C., which causes the stock to pick up moisture to this point. Then the panel manufacturer stores the stock where it will pick up still more moisture, and again redries it to a percentage considerably below the E. M. C. in his plant. After all this procedure, complaints are still heard from all quarters about "buckling" and breakage. I am trying to emphasize that each unnecessary drying operation adds just that much more to your unit costs, and in addition there is always more or less material lost in handling veneers even under correct procedure.

Keeping Stock in Good Shape

By proper storage, veneers will not only be held in perfect shape, but as a matter of fact can be improved and brought into absolute equilibrium with the atmosphere, and at this point will remain perfectly flat. Therefore, instead of dumping them into a moist basement or shed or any other room in which the atmosphere is not controlled, why not make these storage spaces into conditioning rooms?

This can be accomplished at surprisingly small expense. It requires proper arrangement for retaining uniform temperature and humidity and means for circulating the air within the room.

Under these conditions the veneer manufacturer could leave his stock stored almost indefinitely without injury. The panel manufacturer could do the same, and, what is more important, he can forget all about his redrying operation except in cases of stock that must be glued soon after it is received. Of greater importance still is the assurance that stock taken from a properly arranged and controlled conditioning room will remain straight and flat, because it will neither be taking on or giving up sufficient moisture to cause any local expansion or contraction.

What occurs in drying and controlling moisture in veneers is almost identical with lumber except as stated at the outset, the time required is proportionately greater according to the thickness, and no matter what specie of thickness of lumber you are drying and regardless of conditions under which you are manufacturing, there is no reason why any of the common ills should be tolerated.

Cause of Drying Troubles

Case-hardening, excessive warping, bowing, cupping, and honeycombing are all due to unequal drying. In other words, the atmosphere in the kiln is too dry in comparison to the moisture in the stock, and, therefore, the outer portions of the board shrink faster than the inside, because the moisture can not be transfused outwardly fast enough to prevent this. When the outside portion of a board is dried in this way, the fibres are drawn or stretched apart over the wet interior and set rigidly in this condition. Surface checking results frequently in this case, but more often this does not occur. A board, when warm and moist, is somewhat plastic and is not unlike papier mache. When the outside portions of a board have taken a rigid position or formed a shell, it is known to be "case-hardened."

Later on in the drying period, when the inner portion gives up moisture, and consequently must shrink, it is prevented from doing so by the set outer shell. When the internal stresses develop beyond the strength of the fibres, numerous ruptures occur, which we call "honeycombing." Practically all other drying ills can be attributed to the same causes.

Working Out Drying Schedules

Drying schedules should provide specifications of temperatures and humidities for moisture content in the species you are drying in five per cent. reductions. As for example, drying conditions for black walnut containing over 40 per cent. moisture, which is to be used for high-grade furniture, can safely be started at a temperature of 115 deg. Fahrenheit and 85 per cent. Relative Humidity. Tests of the lumber should be made to determine a change of these conditions, as time is a very poor indicator. When the stock shows a reduction in moisture to 35 per cent., the temperature should be increased to 120 deg., and the humidity lowered to 80 per cent. This procedure must be carried out by degrees in accordance with frequent tests of the lumber to an ultimate condition of 150 deg. Fahrenheit and 30 per cent. relative humidity. It may be noted that the first or initial drying condition is equal to an E. M. C. of much less than 40 per cent. moisture; in fact, it is between 16 per cent. and 18 per cent. It is, of course, necessary to maintain a considerably lower E. M. C. than the moisture in lumber in order to reduce it, and, in other words, these conditions indicate a safe drying speed. Because walnut in drying is subject to fine surface checking and other uncommon ills, and for the reason that in this case the stock is to be used for high-grade furniture, conditions are controlled from 40 per cent. moisture instead of 30 per cent., which may be applied in less exacting circumstances, and, in fact, conditions considerably more severe can be applied when the kiln operator at all times is thoroughly familiar with what actually is taking place in the lumber and the kiln.

Tests should be made on two pieces—one to determine the average moisture content and the other to determine distribution of the moisture. The first is common, the second is made by cutting away the outer shell to a line about ¼ inch all around the section and testing this and the remaining centre piece separately. This is very important, especially in all cases where considerable case-hardening and other troubles exist which can only be eliminated by correction of faulty kiln design.

I have attempted to outline in this discussion the fundamental and known principles underlying the process of reducing and controlling moisture in wood and the logical deductions to aid in their practical application in the manufacture of veneers and panels. Discussion of the various details of operation and design of drying equipment has been purposely avoided, my aim being rather to establish the standards with which you can study and compare your present methods and practices.

One advantage the chain mortiser has over that of the chisel one is that it does not make so much noise.

Keep your mortise chain well sharpened, and you lessen the possibility of it breaking.

A very small electric emery wheel, which could be held against the cutters when they are on the machine, would save a great deal of rubbing with the oil stone.

Test babbitt metal by putting a stick in it. If it just browns the stick it is the right temperature; if the stick catches alight it is too hot.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, CINCINNATI, OHIO.

Mahogany and Walnut Veneers

Veneer department at New Orleans, La., showing 10-ft. Rotary and Clipper and 16-ft. Slicer in rear.

Chicago Offices — M. S. Johnson, 39 W. Adams St.
Toronto — J. R. Kennedy, 50 Front St., E.
Grand Rapids — Geo. A. Baker, Hotel Cody.

THE FREIBERG MAHOGANY CO.

Offices and Warehouses:
CINCINNATI - OHIO

Saw and Veneer Mills:
NEW ORLEANS - LA.

Mahogany Importers and Manufacturers

Western Office, 516 Lumber Exchange, MINNEAPOLIS, MINN.

Mills at GLADSTONE, MICHIGAN

The Northwestern Cooperage & Lumber Co., Gladstone, Mich.

THE HOME OF "PEERLESS" STANDARD BRAND PRODUCTS

Manufacturers of

"PEERLESS" ROTARY CUT VENEERS

in Birch, Elm, Basswood, Maple, Ash and Beech for all purposes

Also hoops, liners and staves for manufacture of packages

Also "Peerless" Rock Maple, Beech and Birch flooring; Hemlock lumber; Lath, etc.

"Peerless" products are standard everywhere and you are always exercising Safety First in using them. Try us next time.

(When writing mention Canadian Woodworker)

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SAVE FREIGHT

Rotary Cut Birch and Gum

Why pay freight on gum veneers from southern points when our cutting mill is so near the border.

PANELS

We manufacture Tops, Fronts and Panels of all kinds

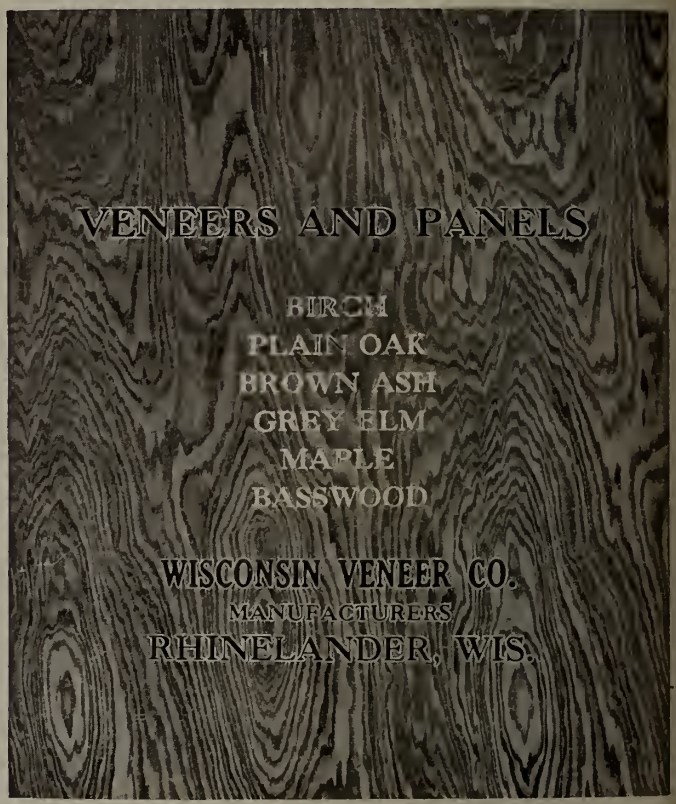
Ask for our "Ready to Ship" Stock List

MOHAWK VENEER CO., INC.

Warren, Pa.

Plywood Dept. Warren, Pa.

Cutting Mill Salisbury Center, N.Y.



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Manufacturers

American Walnut, Figured Gum, Sliced Quartered Oak, and all Kinds of Figured Woods

Walnut and Quartered Oak Lumber

Office and Mill

ROCKFORD - ILLINOIS

J. W. Frye Lumber and Veneer Co.

Dayton - Ohio

Manufacturers and Wholesalers

Specialize in

Walnut Lumber and Veneers

Oak Lumber and Veneers

Also All Native Hardwoods

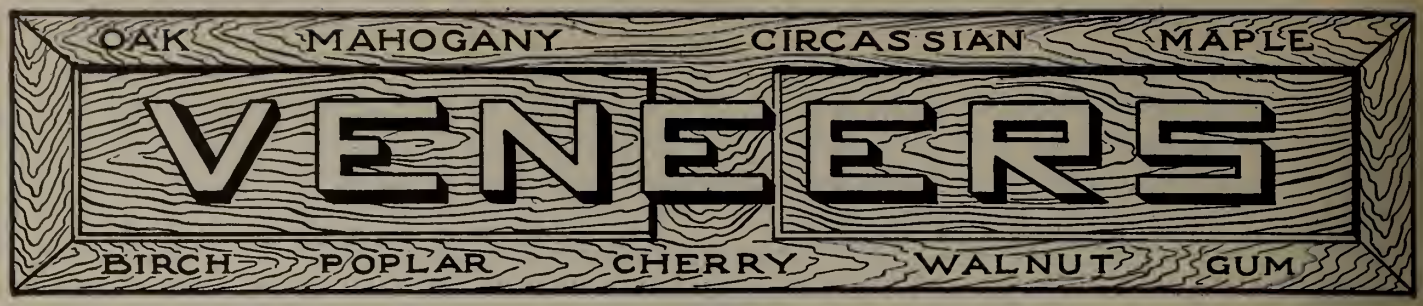
Guarantee all stocks to be Ohio and Indiana grown

ESTABLISHED-1867 HB INCORPORATED-1904
Reg. U.S. Pat Off.

WHAT does it mean to you as a buyer to have implicit confidence in the source of your most important raw material supply? For instance, all informed buyers recognise the true superiority of northern grown hardwood lumber and veneers—the product in which we specialize. Big customers stay on our books for years because it is easy for them to determine that we never have cut anything but the genuine northern grown logs in oak, walnut, maple, ash and other major species. The same sincerity maintains with our rotary cut poplar offering. And withal is that correctness of manufacture and honesty of contact with customers that has been the bulwark of this business for over a half century. It will profit you to know us better.

Hoffman Brothers Co.

Ft. Wayne, Indiana



Poplar and Walnut
Veneers

We specialize in large size poplar veneers as we have extra fine poplar logs. We can cut veneer up to 10 feet square.

Our walnut veneer cannot be beat, both in plain and figured wood.

Write us for prices.

Central Veneer Company
Winter Ave. and Belt R. R., INDIANAPOLIS, IND.

Sovemanco
Southern Veneer Manufacturing Co., Inc.
LOUISVILLE, KY.

Importers and Manufacturers of all kinds of Sawed, Sliced and Rotary-cut

VENEERS

CARRYING

a large stock of selected Mahogany, Figured and Plain Walnut, Walnut Butts, Sawed and Sliced Quartered Oak and Sycamore and all other native woods.

1,000,000 Feet
QUARTERED RED GUM
to select from

WE Respectfully solicit your inquiries

C. E. CURTIS & BRO. CO.
2422 S. Western Ave.
CHICAGO, ILL.

SUPPLYING HIGH GRADE

Veneered Panels

IN ANY SIZE, THICKNESS OR KIND OF WOOD

Immediate Shipment on all Stock Sizes in Walnut, Plain Oak, Birch, Mahogany, Etc.

Wide Veneer

One carload of 1/20″
Quartered White Oak
Sawed Veneer
12″ and wider

Ready for Quick Shipment.

Memphis Veneer & Lumber Co.
MEMPHIS, TENN.

How Many Feet of Panels Do *You* Get From a Thousand Feet of Veneers?

FOR two generations Bachman has been supplying veneers that will lay fifty per cent over the average. That is no boast—there are five sound reasons why we can do it year after year:

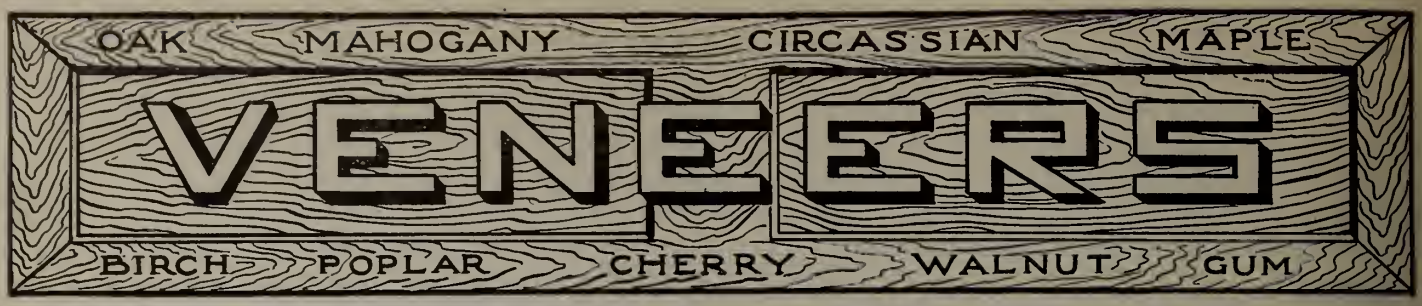
(1) Our logs are absolutely all from Indiana—hence no costly defects in veneer.
(2) We use no flitches except our own manufacture. Thus we are able to carefully select our veneer logs.
(3) All veneers are cut full thickness. This gives plenty of wood for sanding and minimizes breakage in handling.
(4) The sawed stock is so smooth that it can scarcely be told from sliced.
(5) Our stock is never either sorted or picked over.

Our cut runs principally 1/16″ and 1/20″ quarter-sawed white oak, but includes sliced quartered oak; sliced walnut and butts and sliced gum. We are now able to offer to careful buyers the same old fashioned service that has been the pride of our business for two generations.

Do you wish a place on the list? Write

F. M. BACHMAN COMPANY

INDIANAPOLIS, INDIANA



INVESTIGATE

P.-J. SERVICE

For high-grade rotary cut veneer, that is smooth and evenly cut and dried by mechanical means to any percentage of moisture desired.

We also operate large band mills where all kinds of southern hardwood lumber is cut from our own tract of timber in the very heart of the Saint Francis Basin District, Arkansas.

PENROD-JURDEN COMPANY

A Name that Should be on your Enquiry List for both Veneer and Lumber

Mills at Helena and Penjur, Ark. General Offices: Memphis, Tennessee.

Penrod Walnut and Veneer Co.

KANSAS CITY, MO.

Exclusive Manufacturers American Walnut Lumber and Veneers

AMERICAN BLACK WALNUT LUMBER

FAS—6-9¼" Wide, 8-16" Long

3/8"	3,750 Feet
1/2"	21,470 "
5/8"	44,140 "
3/4"	25,962 "
4/4"	82,502 "
5/4"	26,766 "
6/4"	39,201 "
8/4"	33,140 "
10/4"	14,245 "
12/4"	11,470 "
16/4"	3,700 "

FAS—10" and Up Wide, 8-16" Long

1/2"	9,680 Feet
5/8"	18,980 "
3/4"	14,430 "
4/4"	48,872 "
5/4"	14,165 "
6/4"	10,262 "
8/4"	16,920 "
10/4"	10,250 "
12/4"	1,800 "
16/4"	2,100 "

Fas—6"and Up Wide, 6-7 Feet Long

3/8"	1,200 Feet
1/2"	5,790 "
5/8"	840 "
3/4"	8,940 "
4/4"	32,400 "
5/4"	2,300 "
6/4"	7,800 "
8/4"	1,500 "
10/4"	1,400 "
12/4"	500 "
16/4"	400 "

SELECTS

4/4"	32,940 Feet
5/4"	27,530 "
6/4"	21,480 "
8/4"	33,590 "
10/4"	16,850 "
12/4"	6,054 "
16/4"	1,332 "

NO. 1 COMMON

3/8"	8,000 Feet
1/2"	27,380 "
5/8"	29,850 "
3/4"	31,285 "
4/4"	59,675 "
5/4"	38,240 "
6/4"	18,750 "
8/4"	39,240 "
10/4"	16,363 "
12/4"	4,768 "
16/4"	1,604 "

NO. 2 COMMON

3/8"	1,500 Feet
1/2"	1,900 "
5/8"	4,500 "
3/4"	2,190 "
4/4"	72,250 "
5/4"	47,890 "
6/4"	31,720 "
8/4"	35,940 "
10/4"	19,140 "
12/4"	20,116 "
16/4"	16,088 "

Write for prices on any items you are interested in *"PENROD SERVICE" Satisfies*

C. A. Rugg, 115 Foots Avenue, Jamestown, N. Y., Eastern Representative.

Geo. C. Hall, 610 South Michigan St., Representative for Chicago and Michigan territory.

VENEER MANUFACTURERS COMPANY
1036 W. 37th Street, Chicago, U.S.A.

A VENEER FOR EVERY PURPOSE

Rotary Cut, Sliced or Sawn, Figured and Plain,
Domestic and Imported—

All Ready to go on Receipt of Your Order

Orders by mail or phone receive the same attention and careful selection they would have were you present in person.

Send for THF VENEER PRICE-STOCK LIST. *2 per cent on regular terms. No charge for cartage.*

QUALITY *SERVICE*

PICKREL VENEER COMPANY, Inc.

MANUFACTURERS OF

American Walnut
Exclusively

Woodruff and River *New Albany, Ind.*

THE LOG-YARD

piled up with uncut

VENEERS

WALNUT BUTTS • MAHOGANY • LONG WALNUT • BURLS • OAK • POPLAR

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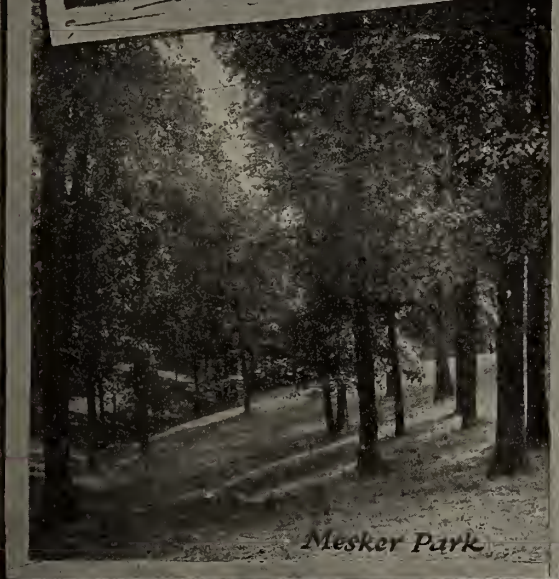
THE WILLIAMSON VENEER CO.

VIEWS OF OUR PLANT No. 2.

H.G.W. fecit



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is substantial and progressive and we are proud of our city.

We are proud of our plant, our product, and our reputation.

A repetition of merit, service and quality together with a capacity to serve made us what we are.

Evansville Line

Quartered Oak
Sliced Walnut
Figured Red Gum
Plain White Oak
Rotary Cut Gum

THE **Evansville Veneer Co.**

MANUFACTURERS OF

VENEERS.

EVANSVILLE, IND.

An organization complete in all details is a guarantee of correct product if properly operated

The operations of the Wood-Mosaic Company function with precision because every step has been part of a well-conceived plan. The basic thought is a plant for each type of production. Thus, every foot of Wood-Mosaic hardwood lumber and veneers in walnut, oak and poplar is produced in a plant designed especially for the manufacture of each class of product.

This holds from the logs, which are the careful selection of a trained corps of twenty timber buyers, through the final operations of handling the manufactured product, special equipment having been provided for each unit of manufacture so that the lumber and veneer product may be always correctly dried and further prepared for consumer's use. We solicit the opportunity of demonstrating the value to you of such an organization.

Wood - Mosaic Company

(INCORPORATED)
(LOUISVILLE, KENTUCKY)

Chicago Representative:
GEO. W. STONEMAN &CO 845 West Erie Street

Grand Rapids Representative:
HECTOR ROBERTSON 232 Lyon Street, N. W.

ALGOMA *the Better* Plywood

Speed!

Did you ever get an order of plywood SHIPPED THE DAY YOUR ORDER WAS RECEIVED?

If you did, was it absolutely correct in surface, correct in dimensions, seasoned, and ready to use?

Such accurate speed is a regular occurrence with Algoma, the Better Plywood. We have a special label to put on orders shipped in this way—we are proud to give such service and offer it to you.

The reason we can handle rush orders so perfectly is that we always work ahead on stock-sized panels. We have a large quantity, in great variety, ready for such emergencies. In a few hours they can be cut, crated and shipped. Whatever you make of plywood, you can make better with Algoma Plywood. Prove this fact by trying one order.

ALGOMA PANEL COMPANY, *Algoma, Wis.*

Time Proves Permanency of Veneers

Investigation Discloses this Practice Common from Earliest Times — Many Famous Pieces are Veneered — Should Answer Skeptics as to Serviceability of Veneered Work

The forthcoming $50,000 trade extension campaign of the National Veneer and Panel Manufacturers' Association bids fair to take a position of importance in the ranks of group movements. The advertising and publicity will be directed by William Clendenin, of the Conover-Mooney Co., Chicago, who conducted the research work for the National Association.

In an interview for "Canadian Woodworker and Furniture Manufacturer," Mr. Clendenin, explaining the purposes and plans of the proposition, stated:—Without tracing the cause, a prejudice seems to have developed in America against things veneered, and even the word "veneer." Realizing the injustice of this indictment, and in order to remove from the public mind this unwarranted prejudice, the Publicity Committee of the National Veneer and Plywood interests had about decided to drop the term "Veneer."

Dates Back to Earliest Times

Before doing so, however, we recommended a research to determine the status of the art, if such it was.

It was found that the art of veneering goes back historically to the dawn of time. The finest furniture of the Pharaohs of Egypt was veneered. The principle of flywood, as well as veneer, was known to them, to the Assyrians, Babylonians, Greeks, and the ancient world generally. Photographs of original fragments and original pictures prove this beyond question. The whole process of veneer has been found delineated on the wall of the tomb of the Pharaoh of the Exodus, described in the Bible.

The throne of Sennacharib, of the Assyrians, was veneered. The warships, the longboats, of Rameses II. of Egypt were built of plywood, on the same principle that the new patrol-wagon bodies of the Department of Police of Chicago are built of plywood, because bullet-proof, bandit-proof—and superior to steel for the purpose.

George Washington's writing desk was veneered; also those of Thomas Jefferson, William Penn, and Dolly Madison. The finest furniture of the famous English periods—the masterpieces of Chippendale, Hepplewhite, the brothers Adam, Sheraton; the famous chest of Cornwall built in Italy in 1592, and probably the forerunner of our modern creations in this line; small pieces de resistance by Cellini, done under the splendid patronage of Francis I., "King of the Renaissance"; superb and exclusive specimens of Florentine veneers, including the world-famous credenzas; specimens in kind from "The Treasures of the Vatican," all owe their excellence and permanence to veneers. Reproductions of plates and authorities taken from Sir Austin Layard's "Assyrian Manuscript," and English magazine articles on Sheraton; "Arts of the Ancients"—including Nippur, Chaldea, Babylon, and Persia; also Hellsing's elaborate French work and plates describing the treasures of the Museum of Cluny, Paris; Jacquemart's "Furniture"—a Viennese work on medieval furniture by von Falke; together with various references in the Ames manuscript (East Indian and Hindoo), in possession of the Crerar Library, Chicago, are convincing evidence of the merits, longevity, and value of veneered articles.

Must Have Some Recommendation

Going back again to the classical period—Cicero paid $45,000 for a veneered table of citrus wood. The proudest possession in the palace of the imperial Caesar was a veneered table. "Tiger Tables," "Panther Tables," and "Bee Tops" were literally the vogue in ancient Rome—and every one of them veneered.

Very ancient specimens of plywood construction and veneered surface are peresrved not only among the treasures of the Vatican and the famous museums of the Louvre and the Cluny of Paris, but also in the South Kensington Museum in London, the British Museum—not to mention many famous specimens preserved and treasured in this country. For instance, in the museum of Portland, Maine, they have the famous escritoire or writing cabinet of Marie Antoinette, saved from the wreck of the French Revolution and brought to this country by General Knox. All these pieces are veneered—as is also the most beautiful piece of furniture in the world, the "Bureau du Roi," the cabinet of the king—made at a cost of half a million dollars for Louis XV. of France.

The little cabinet which the soldiers of the Old Guard called the "Bureau de Campagne," and which accompanied Napoleon on the most famous battlefields of Europe—was a veneered piece done in rosewood.

Prove Serviceability and Permanence

The importance of these facts is that they are at once the supreme answer to the prejudice against veneer. Veneer is a fine art and has been through the highest civilizations of mankind and in every land, anciently, through the medieval period and the Renaissance, down to the splendid modern processes which made veneer the fine art of today.

Hundreds of photographs of these specimens and exhibits were accumulated during the course of this research and will furnish the background and picture matrial for the advertising campaign, both for veneer and plywood.

The trade extension advertising campaign will include trade papers, to reach the business interests concerned, also leading publications read by the general public. The campaign will be educational in character and every point advanced will be proved by authority and photograph. All advertisecments, booklets, and follow-up literature will convey two stories, one on veneer and the other on plywood, showing the built-up laminations or layers of plywood and the grains of the alternate pieces running at right angles, all bound together in monolith by glue and under heat and pressure. The campaign will be launched this fall.

Emery is in its right place when made into a wheel. When allowed to get into the bearings of a machine its usefulness is gone, and its cutting powers spoil the bearings.

VENEERS

The Quality Kind

We carry in stock, for immediate shipment, 3 and 5 ply Panels in Birch, Oak, and Mahogany — sizes 24" and 30" wide, 48", 60" and 72" long.

A complete range of American Walnut, Quartered Oak, Mahogany, Figured Gum Veneers and Rotary Cut Veneers.

It is not uncommon that a really fine piece of furniture has been practically ruined after a few months service because of the poor grade of veneer used. Such happenings do much to harm the manufacturer's reputation. That is why many will not consider anything but the best—usually they insist on Toronto Veneers—the quality kind.

Toronto Veneer Co., Ltd.

1100-1104 Queen St. West, TORONTO, ONT

Walnut, Quartered White Oak and Mahogany Veneers and Lumber

Prompt Delivery

LONG-KNIGHT LUMBER COMPANY

INDIANAPOLIS, IND.

Plywood Automobile Wheels

One of the newer developments in the production of plywood articles is the manufacture of built-up wood wheels for automobiles and trucks. These wheels, which are known a sthe "Smith Woodisk Wheel," are made of the same woods as were used in the propellers for aeroplanes, and are so constructed that the grain of the different layers of wood runs in various directions. In weight they are about the same as the ordinary wooden wheels with spokes, but are much stronger, particularly in regard to side stresses, i.e., skidding strains. The wheel band, which is of steel, is shrunk on what practically amounts to end grain and, therefore, does not work loose or slip.

In comparison with cast steel wheels for auto trucks, they show a saving in weight of 33 pounds for each rear wheel, and 42 pounds for each of the front wheels, giving a total saving in unsprung weight of 150 pounds in favor of the laminated wheel. It is also claimed that, owing to their resiliency, they absorb a certain percentage of the knocks and jolts encountered on the roadway.

The use of disc wheels, whether of wood or steel, is growing in popular favor. This is probably due to the fact that they give the car an air of smartness which would otherwise be unattainable. In addition they conform to the finish and general lines of the car. It would appear as if, when the advantages of the laminated wood wheel over those of steel construction are more widely recognized, that this type of wheel will be adopted as standard equipment by many of the larger manufacturers of automobiles, as well as being in strong demand by car owners in general.

This is but another step in the direction of the all-wood car. At the present time there are cars on the market with laminated wood tops, laminated wood bodies, wood frames for the chassis, and now we have the plywood wheel.

Comparative Prices on Basic Commodities

A recent issue of the "Commerce Monthly," published by the National Bank of Commerce of New York, contains a number of wholesale prices on every-day commodities which are of particular interest because they give comparative values covering the years 1913 to 1921.

Cattle that were selling for $7.85 a cwt. in January, 1913, $8.60 in January, 1914, and which reached $16.80 in October, 1919, are now being offered at $8.10. Anthracite coal, $4 in January, 1913, advanced to $8, October, 1920, is now selling for $7.90. Bituminous coal, run of mine, based on values in the Pittsburg district, was $1.30 in January, 1913, $10 in July, 1920, and is now selling for $2.50. Copper was quoted at $17 in 1913, $28.25 in 1916, while to-day's quotation is around $1.37. Cotton, $12.50 in 1913; $41.50 in April, 1920, and $11.88 in July, 1921. Hides, 18¾c in January, 1913; 52c in July, 1919; 13c in July, 1921. Hogs, $7.40 a cwt. in January, 1913; $8.25 in January, 1914; $22.10 in July, 1919; $9.40 in July, 1921; Pig iron, $16.35 in January, 1913; $46 the latter part of 1920; $19 in July, 1921. Steel billets, $29, January, 1913; $20, January, 1914; $65, April, 1920; $33, July, 1921. Lead, $4.35, 1913; $9, April, 1920; $4.55, July, 1921. Crude Pennsylvania petroleum, $2.05, January, 1913; $6.10, the latter part of 1920; $2.25, July, 1921. Crude rubber, $1.10, 1913; $16.50, 1914; 56c, July, 1921. Wheat, 91c a bushel in 1913; $3.10 in January, 1920; $1.40 in July, 1921. Wool, 72c in January, 1913; $2.33 in April, 1920; 83c in July, 1921.

A glance at these figures will show that, while the values of some of the commodities are still considerably above their pre-war levels, such items as cattle, copper, cotton, hides, petroleum, and rubber are selling to-day at prices below those which prevailed in 1913 and 1914. Iron and steel and wheat are considered to be basic commodities which, if they do not control, give a fair indication of the trend and level of values. Iron is still about 35 per cent. higher than it was in January, 1914, but the present quotation of $19 per ton shows a marked reduction from the peak price of $46 reached in 1920. The same holds true of steel. It is still a little over 50 per cent. higher than it was in 1914, but, like steel, this commodity shows a decline of from 50 to 60 per cent. from the high levels of 1920.

On the whole, these figures would seem to indicate that values are rapidly reaching a level—some have already touched such a point—which presages a return of business in normal volume. Iron, steel, and labor are still declining, and when these commodities drop to a satisfactory figure, we can look for business to increase in a very satisfactory manner.

J. Victor Tobey, a former resident of Owen Sound, has invented a dispensing showcase for use in grocery stores. It is claimed that this is an improvement on any similar line on the market, being a dispensing showcase, a display case and a silent salesman combined. The device has a glass front for display, a drawer for sampling and a hinge top for refilling. One feature of the bins is the fact that the goods are taken from the bottom and as each scoopful is withdrawn, the contents automatically drop. This assures that the old stock is sold first as the new stock is always on top. Application has been made for patents, and if granted, this device will be put on the market.

WE HAVE A COMPLETE STOCK OF 3 and 5 PLY PANELS IN VARIOUS WOODS AND THICKNESSES FOR QUICK SHIPMENT

Also offer ⅜" 3 ply Fir s-2-s Panels for Drawer Bottoms and Backing.
⅛" Rotary Cut Northern Red Oak
⅛" Rotary Cut Northern White Oak.
⅛" Birch Veneer 6 to 36" wide 60 to 86" long.
Panels also made to your dimensions.

Write for Prices

GEO. L. WAETJEN & CO.
Milwaukee - Wisconsin

100% EXCELLENCE

Manufacturing
High Grade ROTARY CUT VENEERS
Specializing BIRCH DOOR STOCK, MAPLE PIANO PIN BLOCK STOCK

Years of Experience Behind Our Products

The Munising Woodenware Co.
MUNISING, MICH.

Canadian Hardwoods

Good Stocks
Right Grades
Prompt Shipments

:: Members National Hardwood Lumber Association ::

Crating
of all descriptions

C. A. Spencer, Limited
Merchants and Manufacturers
McGILL BUILDING - MONTREAL

THE
GALL LUMBER CO.
Limited

Established 1875

HARDWOOD LUMBER

MAHOGANY, WALNUT

Office, Yards and
Service Dry Kilns
Foot of Spadina Avenue
TORONTO, CANADA

LELAND G. BANNING
CINCINNATI, OHIO

Our Specialty:

SOFT OAK PLAIN AND QUARTERED

also MOUNTAIN POPLAR
WALNUT, ASH, CHESTNUT
OTHER HARDWOODS

Canadian Representative:
A. E. KLIPPERT,
11 LAXTON AVE.,
TORONTO, ONT.

BAND MILL:
FRANKFORT, KY.

PREVENTION AND REMOVAL OF GLUE STAINS.

Casein and vegetable glues containng caustic soda produce stains on certain kinds of wood, notably the oaks, maple, cherry, elm, ash, birch, and beech. Some glues stain the wood more than others, and those that contain the most alkali are likely to be most injurious Staining is due to the action of the alkali in the glue on the tannins and other constituents of the wood, whereby a substance related to ink is formed. No means have yet been found of preventing this chemical action. Precautions can be taken, however, which will keep the discoloration from the finished surfaces. The most trouble with glue stain in woodworking is caused by the penetration of the glue solution through thin face veneers. This seepage s very likely to occur if the veneer is less than 1/20 inch thick and somewhat porous. The consistency of a glue in part determines whether it will be squeezed through the wood or not. It is quite obvious that under similar conditions a thin glue will penetrate further than a thick glue. For this reason the quantity of water that is added to the glue might be deminished and "fillers" added when staining is feared. The amount of pressure exerted by the panels in the press is also a factor, but it would not be advisable to reduce the pressure in order to check the flow of the glue.

If a panel is dried promptly, the caustic-soda solution will have difficulty in coming to the surface. Rapid drying can be brought about by removing the panels from the press as soon as it is safe to do so, and placing them on stickers. The amount of staining can also be decreased somewhat by placing a caul or some other flat object between adjacent panels in the press.

Casein and vegetable stains can be almost entirely removed by sponging the staned surface with an oxalic-acid solution, prepared by disolving 1 ounce of oxalic-acid crystals in about 12 ounces of water. Still better results may sometimes be obtained by moistening the wood first with a sodium-sulphite solution made up in the same concentration as the oxalic-acid. In this way very stubborn stains can be almost obliterated.

USE AND CARE OF DRY KILN INSTRUMENTS.

The correct use of the hygrometer is of vital importance in the interpretation and consequent regulation of kiln conditions. Drying conditions altered because of the false conception of the conditions present often result in honeycomb and other highly detrimental degrade. Several basic practices are guggested by the Forest Products Laboratory for the proper handling of hygrometers.

Calibration.

Hygrometers should never be assumed as registering the correct reading until their accuracy has been established. It is not at all unusual for a thermometer to register a few degrees higher or lower than the correct temperature. Each thermomenter of a hygrometer should be checked against a standard thermometer of known accuracy over the range of temperatures anticipated in its use. Corrections for several temperatures may thus be determined if inaccuracy exists. Checking should be done with the bulbs of the standard and the tested thermometers close together and in the same medium and temperature of medium. The correction factor for a thermometer at a certain reaing being known, it is simple enough to determine the true temperature.

Filling and Care.

Hygrometer reservoirs should be filled with pure water only. The open-top type of reservoir is easily filled but the inverted type often presents difficulties. The latter type may be filled if submerged horizontally in a pail of water with the water level slightly above the well opening. Others methods of filling such a tube are by means of a wash bottle or small bentstem funnel. In any case the body should be dropped below the mount level.

It is important that silk or muslin covering of the wet bulb be kept in good condition at all times. At least a small amount of solid material is always left in the meshes after evaporation, and sooner or later such deposit impedes the transfusion of miosture. It is because of this pure or distilled water should always be used in the reservoir and that the wick frequently be changed.

Placing the Hygrometer.

The hygrometer should be placed at exact points where information as to conditions is desired. Do not place it near a door or a wall, or where it will be subjected to direct radiation from the heating coils, as conditions at these points are probably not representative. To obtain representative conditions take an average of several readings in different parts of the kiln.

Taking the Readings.

In reading the wet-bulb thermometer care should be taken that there is sufficient air circulation to give the maximum evaporation rate from the bulb covering, at low temperatures, i. e., up to 120° F., there should be an air velocity of at least fifteen feet per second. At the higher tempeartrues this rate is not quite so essential. A thorough fanning of this air about the wet bulb is usually required. The lowest wet bulb reading for any air condition is the one desired.

EXPORTS OF BOX SHOOKS.

According to figures contained in the May issue of the Monthly Trade Report, the Canadian manufacturers of boxes and box shooks are gradually increasing their export trade. The figures for April and May 1921 show exports of these lines to the value of $168,000. as compared with $64,000. for the same period of 1920 and $50,000. for April and May 1919. This total is made up as follows:—Exports to U. S. markets $20,000.; Australia, $1,000.; Straits Settlements, $140,000.; British South Africa, $5,500.; British West Indies, $1.000. These figures only go to show the possibilities which lie in the export of boxes and box shooks.

There are many other large foreign markets, such as Egypt, India, South America and others, which apparently have not been touched by Canadian manufacturers. The imports of box material by some of these countries runs into millions of dollars.

Heavy felt fasteners are very dangerous in belts. They may come against one with terrific force when the belt breaks.

The chances of accidents increase rapidly with every hour a man works without a rest. Four hours should be the limit for one period of work upon a machine.

Adverse Conditions Have Not Affected the Quality of Our Lumber or Service

AT ONE POINT in the development of a modern busines its driving force may keep it going brilliantly while conditions are favorable. Later it gains a solidly established state, imparting a degree of momentum sufficient to maintain the forward movement even under the most trying circumstances.

So with the Anderson-Tully Company, pioneer manufacturers of Southern hardwood lumber, veneer and plywood. Great diffculty in operation has in no way impaired our ability to serve you correctly. The Anderson-Tully Company trademark will always be known where the best in goods and service are most appreciated.

Order from Anderson-Tully on present low prices

ANDERSON-TULLY COMPANY
MEMPHIS

LIVEZEY

News of the Trade

Percy Devine, manager of the Wright Piano Co., Strathroy, Ont., recently joined the ranks of the benedicts.

The F. Bowden Lumber Co., Toronto, contemplate erecting a planing mill in connection with their yard at Yonge St. & Humberside Ave.

The Saskatoon Cabinet Works, Limited, Saskatoon, Sask., were recently incorporated to carry on a general woodworking business. Capital $10,000.

The garage of the M. F. Beach Co., furniture manufacturers, Winchester, Ont., was recenty destroyed by fire; loss $20,000.

An addition is being made to the plant of the Crown Furniture Co., Limited, Preston, Ont. This will be used as a machine shop.

Calvin S. Kunkel, Canadian representative for the Marietta Paint & Color Co., Marietta, Ohio, recently joined the ranks of the benedicts.

F. A. Shand, president of the Windsor Furniture Company., Windsor, N. S. spent a few days in Toronto recently on his way to B. C.

Casavant Freres of St. Hyacinthe, P. Q., recently installed a new organ in St. John's Church, Arthur, Ont.,

Mrs. E. B. Eddy, widow of the late president of E. B. Eddy, Co., Limited, Hull, Que., recently passed away at her home in Ottawa.

Spence & Wilds, furniture manufacturers, Vancouver, B. C., have disolved partnership. The business will be continued under the directorship of J. Spence.

J. A. Cadenhead of Toronto, formerly with the Anderson-Miller Lumber Co., has been engaged as an inspector with the National Hardwood Lumber Association, and has entered upon his new duties.

The Brockville Furniture Co., Brockville, Ont., who have been conducting a retail business for many years, recently commenced the manufacture of a line of high-grade Chesterfields.

John W. Nelson recently opened a cabinet-making and upholstering shop at 216 Wellington St. Sarnia. Mr. Nelson has had many years' experience in this line and should make a success of his new venture.

Chandler & Allen are equipping a new woodworking plant at Windsor, Ont. The lines to be manufactured include sash, doors, cabinet work, interior and exterior fixtures and fittings of all kinds and store fronts.

The sawmill and woodworking plant of the Richards Mfg. Co., Campbellton, N. B., was recently destroyed by fire. The loss amounts to about $60,000. In all probability this plant will be rebuilt early in the coming year.

Beique, Limited, Montreal, were recently incorporated to manufacture and deal in pianos, phonographs and other musical instruments. H. M. Duchesne and C. A. Beique, both of Montreal, are two of the incorporators. Capital $20.000.

N. Blain, Limited, Montreal, were recently granted a provincial charter to manufacture and deal in carriages, wagons, sleighs, motor trucks and automobiles. Capital $49,000. Hector Blain and Albert Blain, two Montreal accountants, are among the incorporators.

A general meeting of the newly incorporated Alliston Wood Products Limited was held at 95 King St. East, Toronto, on August 9th for the purpose of electing a board of directors.

The St. Johns Board of Trade Housing Scheme Co. contemplate erecting a large number of houses in the near future. The sum of $150,000. has been granted them and if found necessary, another $150,000. will be forthcoming.

A firm known as the "Canadian Automatic Barrel Machinery Co., Limited," Toronto, was recently incorporated with a capital of $1.000,000., to manufacture barrels and barrel-making equipment. A. G. Ferguson, barrister-at-law, and E. C. Buckle, builder, are among the incorporators.

The Berliner Gramophone Co., Montreal, held their eighth annual picnic recently. About 1200 persons were in attendance. Edgar M. Berliner, vice-president of the company, and R. L. Chivers, sales-manager, together with the entire executive staff, were in attendance.

Delaney & Petit Co. of Toronto, are now manufacturing a line of sandpaper, This firm has been handling this product for many years but it is only recently that they commenced producing a line of their own. The brands, grading and quality will be the same as that with which they have been supplying the trade.

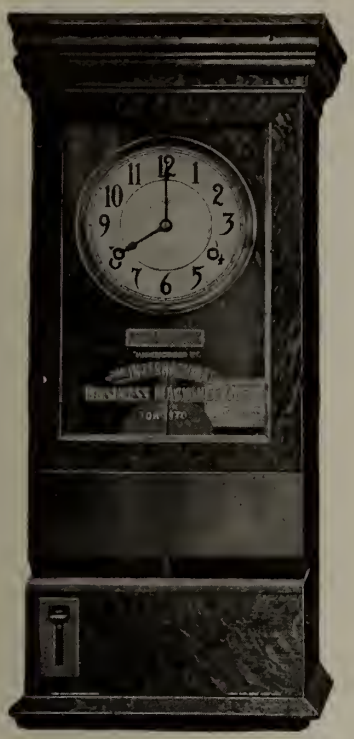
According to a Kingston report, the Collingwood Shipbuilding Co. have put into effect a 55-hour week, that is 10 hours per day for 5 days, with 5 hours on Saturday. A slight reduction in pay was also embodied in the new announcement. Some time ago the same shipyard reverted from the 8-hour day to the 9-hour day.

Bournival Piano & Gramophone, Limited, Montreal, were recently incorporated to manufacture and deal in pianos, phonographs, musical instruments of all kinds and household furniture. Capital $200,000. L. O. Bournival, M. D., Outremont, P. Q., and J. E. Drouin, Sault-aus-Recollets, Montreal, P. Q., are two of the incorporators.

The Chatham plant of the International Harvester Co., Limited, is being equiped to manufacture "International" motor trucks. Heretofore these trucks have been imported from the American plant. This change has been found necessary because of the increased demand. The Chatham plant formerly produced a line of wagons and sleighs.

McLagan Phonograph Corporation, Limited, Stratford, Ont., have issued a new price list which shows a considerable reduction over previous lists. This is in keeping with their policy of cutting their prices as low as possible without sacrificing quality. The McLagan phonograph has been accorded gererous support, having met with popular demand, and it is only through high production that such reasonable prices are possible.

The North American Funiture Co., Limited, Owen Sound, recently furnished a rest room for their employees. This room is about 20 ft. square and is situated on the main floor of their factory. Both hot and cold water are available and an electric stove has been provided for heating tea, coffee and other food. A number of comfortable settees are being built and when completed will be placed around the room, giv-



THE
INTERNATIONAL
Job Time Recorder

by which your actual productive hours are easily computed. It gives you a reliable printed record of every job—a record that you know is accurate and unchangeable. It is flexible enough to easily handle the work of any department in your plant.

The number of large furniture and woodworking factories that have installed them is your assurance that they are a profitable investment.

Time - Loss Insurance

Almost every business risk is covered by modern insurance except perhaps – ***loss of time.***

If you have a system that keeps an accurate record of the labor purchased, you are only "half insured"– you are not protected against loss of production.

We suggest a complete ***time-loss policy*** – one that checks your productive hours against your purhased hours. It is the only sure method of regulating your labor costs.

INTERNATIONAL Time Recorders and Job Time Recorders

will give you ***absolute*** protection. You can tell by a glance at the printed sheets or cards the margin of difference – the margin that represents a dead loss in your production costs.

This difference can only be regulated to the lowest point by records that are accurate, unchangeable and at all times readily accessible.

If you are interested in insuring your plant against ***time-losses*** and ***under-production,*** get in touch with our nearest branch.

International Business Machines
SPEED ACCURACY ECONOMY

International Business Machines Co.
LIMITED

F. E. MUTTON, Vice-President and General Manager

Head Office and Factory: 300-350 Campbell Avenue, Toronto

HALIFAX, 44 Granville St. ST. JOHN, 29 Dock St. QUEBEC, 506 Merger Bldg. MONTREAL, 1 and 3 Notre Dame St. OTTAWA, 190 Queen St. TORONTO, 409½ Yonge St. HAMILTON, Room 8, 36 James St. S. LONDON, 489 Richmond St. WALKERVILLE, 44 Lincoln Rd. WINNIPEG, 227 McDermott Ave. VANCOUVER, 230 Cambie St. SASKATOON, 254 Third Ave. S.

Also manufacturers of International Dayton Scales and International Electric Tabulators

ing it a comfortable, cosy appearance. A fine large library table and a bookcase for magazines, trade journals and other reading material, completes the furnishings. At the present time about eighty men are employed, but as the prospects are rather bright for increased business in the fall, it is expected that the staff will be increased.

H. Leir and M. S. Peacock are equiping a box factory to be operatted in connection with their sawmill at Penticton, B. C. They have purchased a box factory at Langley Prairie, B. C., and are moving the machinery and other equipment to Penticton.

E. D. Palmer, the energetic representative of the Windsor Paint & Varnish Co., Limited, Windsor, Ont., is once more able to resume his duties and call on the trade. Mr. Palmer has been seriously sick during the past nine months and his many friends and acquaintances will be glad to see him in harness again.

The John Morrisey Furniture Co., Limited, Newcastle, N. B., was recently incorporated to take over as a going concern the business conducted at Newcastle, Caraquet and Dalhousie, N. B., by John Morrissey, and to manufacture and deal in furniture, lumber and wood products of all kinds. Capital $75,000.

The large planing mill of the J. B. Snowball Co., Chatham, N. B. was recently visited by fire. This part of the plant was completely destroyed and it was only by strenuous efforts that the foreman suceeded in saving the large sawmill and stock of lumber. The loss is a heavy one, particularly so as this was the only part of the plant which was in operation.

Figures recently issued by the Dominion Bureau of Statistics covering the furniture industry in Canada during 1920, deal with 270 individual plants; total capital invested $24,500,000.; number of employees 9000; aggregate salaries and wages $7,900,000.; cost of material used $9,700,000; total values of product estimated at point of manufacture $25,175,000.

Patrick Ryan recently passed away at his home in Toronto. Mr. Ryan was a partner in the firm of Ryan & Hughes, manufacturers and dealers in antique furniture. The deceased was born in Lismore County, Ireland, and came to Canada at an early age, settling in Guelph. He moved to Toronto about sixteen years ago. Thomas F. Ryan, manager of Ryan & Hughes, is a brother.

The different furniture factories at Stratford, which have been idle for periods of varied length, resumed manufacturing on August 2nd. Orders have been coming in more freely of late and from present indications there will be sufficient work to keep the factories operating for the balance of the year. This affects the McLagan Furniture Co., Limited; Stratford Chair Co., Limited; Farquharson-Gifford Furniture Co., Limited, Globe-Wernicke Co., and Kindel Bed Co.

It is hard to understand why, when Canadian plants are in need of orders to provide work for their employees, that the imports of certain lines of woodwork, such as doors and furniture, should remain at a comparatively high figure. During April and May 1921 doors to the value of $46,000., were purchased in American markets, while for the same period furniture to the value of $58,000., was brought into Canada.

The Canadian Air Board contemplates the construction of an all-Canadian flying boat, designed and built in Canada to meet Canadian civil flying conditions. This Board is doing all in its power to foster the air craft industry, and it is felt that the designing of a special flying boat, to meet conditions peculiar to Canada, may pave the way to operations on a larger scale. The design is to be based on the experience gained from actual operations and experiments which have been carried out.

Certain buildings belonging to the Sutherland-Innes Co., Limited, Chatham, Ont., cooperage stock manufacturers, were recently destroyed by fire. The loss amounts to around $15,000. The buildings destroyed were filled with staves, heading and hoops, very little equipment beng burned. Manufacturing operations are being carried on as usual.

A Fredericton despatch records the arrival of the Stratford furniture manufacturers who left recently for a tour of the Maritime Provinces. The party includes L. J. Salter, H. W. Strudley, Chas. Farquharson, D. W. Burns, W. J. Anderson, Chas. Lordley and Mr. and Mrs. Moore. The visitors were entertained by the local furniture men and were shown the various points of interest in and about the city.

Meaford Mfg. Co., Limited, Meaford, Ont., are placing a line of attractive furniture on the market in what is known as "Meaford Walnut Finish." This has a very handsome appearance and can scarcely be distinguished from real walnut. It is secured by transferring the imprint of walnut grain to maple and then finishing by a special process. Meaford walnut will be made in dining room, bedroom, hall and library furniture.

The Da-Nite Furniture Co., Limited, were recently incorporated to manufacture and deal in folding and apartment furniture of all kinds. The line includes folding davenports, combination bed and table, combination dressing table and bedroom table, and combination desk and table. Capital $200,000. T. Draper and R. Walton, both of Toronto, are among the incorporators. In connection with this new firm, the W. A. Moore Co. of 11 St. Albans St., Toronto, have secured a contract to manufacture their lines.

The Georgian Bay Stave & Shook Mills is the name of a concern recently organized in Owen Sound, Ont., to manufacture barrel and keg staves, heading and boxes. N. E. Bumstead and W. E. Theaker are the proprietors of the new company. A building formerly used by the Grey & Bruce Cement Co., has been taken over and the necessary equipment is being installed. It is not expected that the plant will be in operation in time to cater to the apple industry, but several orders have been secured for kegs for nails, iron, etc. A considerable volume of business is in sight, and it is expected that the plant will be able to operate continously.

The Japanese box manufacturers are becoming quite a factor in the Indian and Singapore markets. They import rough dimension stock from B. C. and resaw it up in their own plant. The government of Japan maintains an import duty on woods of various kinds and sizes, but for some time large timbers have been permitted to enter Japan duty free. For this reason the box manufacturers of the country have been importing big timbers up to 25 x 24 x 40' long. However, special provision has been made for the free entry of lumber to be worked up into boxes and box shooks. This should have the effect of stimulating the box industry.

One Reason why Kraetzer Cured Gum is Straight and Flat.

Kraetzer-Cured Gum

THE ONLY KIND THAT IS ALWAYS BRIGHT, STRAIGHT AND FLAT

Kraetzer-Cured Gum does not "work" after being made up into furniture. It does not warp or open at the joints, or check in panels in the way that other less scientifically handled lumber does.

If you have used Kraetzer-Cured Gum, you know this already. If not, you owe it to yourself to find out about this super hardwood.

This "quality product" does not happen by chance. One reason is that Kraetzer-Cured Gum is steamed in the Kraetzer Preparator. Then every board is carefully graded, the sticking is scientifically and perfectly done, every stack is side ventilated, is elevated, and every pile is on wheels. Then, to begin with, remember that Kraetzer-Cured lumber is made from large virgin timber of exceptional quality.

Besides Gum, we have Oak, Ash, Tupelo, and Cypress of a quality that is unsurpassed.

Write us today for the reasons why Kraetzer-Cured lumber is *different* and *better*. We guarantee every board.

Our Protection

THE KRAETZER-CURED LUMBER CO.

Your Guarantee

The Kraetzer-Cured Lumber Co.

GENERAL OFFICE: GREENWOOD, MISS.

Band Mills: Greenwood, Miss., Moorhead, Miss.

According to officials of the Imperial Desk Co., Evansville, Ind., the European market for desks is showing signs of revivinng. This firm does a world-wide business and early in the year shipped a considerable proportion of its product to Europe, but the unfavorable exchange situation tended to check this business. With the solution of the war debt payment problem seemingly nearer, foreign buyers are again evincing an interest in desks made on this side of the water. Globe-Wernicke Co., and Kindel Bed Co.,

Claude A. McMurtry, a director in the Gold Medal Furniture Mfg. Co. Ltd., has recently been appointed assistant general manager. Mr. McMurtry was a Field Artillery Officer during the war, being gazetted from the Royal Military College, Kingston to the Royal Horse and Royal Field Artillery. He served in France continuously from 1915 till after the armistice and resigned his commission in November 1919 to enter the services of the Gold Medal Furniture Mfg. Co. Ltd.

The employees of the Canadian Blower & Forge Co., Limited, Kitchener, Ont., held their second annual picnic recently in Waterloo Park. A number of interesting sporting events were run off, including baseball, races and other similar numbers. Out-of-town visitors in the attendance included E. S. Wendt, Buffalo, N. Y., vice-president of the Buffalo Forge Co. and of the Canadian Blower & Forge Co., also George Neher, superintendent of the Buffalo Forge Co's. plant. The picnic was an outstanding success.

WHEN TO REPLACE OLD MACHINES.

By A. C. Kaufmann.

I was talking to one of the world's largest sewing-machine manufacturers the other day and the question came up: When should a machne be replaced by one that is more up-to-date and adapted to the work? His answer was—" By keeping up-to-date in the matter of machine equipment I find that we have been able to meet the enormous increase in our business without having to increase our floor space. The moderm high-speed machines not only require the same room necessary to the old slow moving ones, but increase capacity several times.

They also conduce to greater uniformity as one machine can do the work of several old type ones. Besides they're easier on the men. Many of our high-speed tools have automatic-feed and require little exertion on the operator's part. Had it not been for power-saving machines to increase the world's productive power, men would still have to toil from dawn until night to supply the bare necessties of life.

" But to get back to the point. I believe in making changes as they come without waiting until the old machines are being taxed to their utmost capacity. If your business has not doubled, but machine capacity has by all means install those machines which will do the necessary work in half the time. In this way half the time your operators could be doing something else, and this would bring a high interest on the money invested in new equipment.

" Take our case. We had 27 old style 6" stickers in operation on oak, Walnut and Gum, running on widths up to 4" and in lengths from one to two feet. On these old machines the operators had to handle each piece separately and give it an extra hard push at the start as the feed rolls had to be low in order to give proper tension and an effective feed. Our men worked piece work, feeding the stock at from 20 to 30 feet per minute for ten hours straight so you can imagine a man's arm and shoulder got pretty sore at the end of a day's work of that kind."

One mill, I know, runs four planers most of the time, day and night, one sngle sizer, two matchers used as surfacer and for S1S1E. Old machines, all of them. Matchers running at the highest only 80' vinced that the company could cut out the night crew kind, also loss tightening side head belts, because of lacing and no adjustable tighteners. With one of the old matchers thrown out and one new fast feed matcher with top and botom profiler installed, I am firmly con-more altogether than the old ont (and doing better entirely. I figure the new matcher would do 2½ times as much work as the present running, and ½ times as much through saving, in changing. Doing three times more altogether than the old one (and dong better work besides) it would mean as much as two more old type machines, which is about all running on the night crew. The night crew consists of one fireman, two feeders, two offbearers, two loaders, about $28.00 a night outside of saving in belting, light, grease for engine and planers and line and shafting and fan, etc.

However, the new machine would necessitate say two men more on the day crew to take proper care ot bringing stock to the machine and pushing out of the finished product. Come to thnk that three times more output is almost too low an estimate when I see that even with 1 x 12 the daily output per machine is between 16 and 20 M ft.,

In any event, if the company is intending to run for a longer future period, it would pay I think, to install a fast machine, which ought to pay for itself in almost a year.—" Yate's Quality."

Pointers on Knife Grinding

Always caliper each end of knife before clamping it fast. Some cases when one end is wider, set that end out far enough to equalize it in the grinding; if one end is wider than the other it throws head out of balance. It is a hard job to try to keep thin knives straight in the clamp and the operator who sets the knives must spring them some in the head.

Great care should be taken in selecting the proper grinding wheels with proper qualities for that particular work and keep this wheel free from glaze with a wheel dresser or by chipping it off with a piece of steel. Chipping the wheel aids it in cutting with less heat and naturally saving the temperature of the cutting edge of knife.

When ordering a grinding wheel, give dimensions, the speed, and whether it is to be run wet or dry; the kind of knives to be ground should be also given.

A round gullet in the tooth prevents cracks coming in the saw.

One of the most essential things for a country's prosperity is very cheap power.

Round cutter safety heads are now made to cut with the same angle as square heads.

Large pulleys, while weighing more upon the bearings than small ones, reduce the slip of the belting to a minimum. They are better than dope for ensuring certainty of action.

VENEERED PANELS

FOR KITCHEN CABINETS DRAWER BOTTOMS, Etc.

PLAIN OAK and MAPLE

We can furnish panels for kitchen cabinets, phonograph cabinets, drawer bottoms, furniture, etc., in plain Oak and Maple. Prices on request.

Panels are also made in Walnut, Quarter Oak, Basswood, etc. Large sizes (72x24; 60x30; 60x24; 56x25; 60x20; 60x18; 48x18) carried in stock at all times.

Get in touch with us

HAY & CO., Limited

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We Offer 1921 Cut Hardwoods

4	cars	4/4	in.	no. 3 Com. & Btr.	Basswood
3	cars	5/4	in.	no. 2 Com. & Btr.	Basswood
1	cars	6/4	in.	no. 2 Com. & Btr.	Basswood
2	cars	6/4	in.	no. 2 Com. & Btr.	Birch
2	cars	8/4	in.	no. 2 Com. & Btr.	Birch
2	cars	12/4	in.	no. 1 Com. & Btr.	Birch
5	cars	4/4	in.	no. 2 Com. & Btr.	Maple
2	cars	8/4	in.	no. 2 Com. & Btr.	Maple
2	cars	12/4	in.	no. 1 Com. & Btr.	Maple

Good Stock at Attractive Prices

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Selling Graves, Bigwood & Co.'s Lumber, Lath and Box Shooks

General Woodworking Trade Mart

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Equipment Materials Employment

GOOD VALUES

Subject to Prior Sale

These are only a few of our stock

Moulder, Hermance, 8 and 10", 4 side.
Moulder, Woods, 10 and 12" inside.
Moulder, American, 10", 4 side.
Sander, endless bed, 48", H. B. Smith.
Belt Sander, Curtis No. 20.
Sander, Moore Machine Co., belt.
Matcher, American No. 229, fast feed hardwood flooring.
Band Resaw, Connel & Dengler, 60".
Band Resaw, Mershon, 44".
Band Rip Saw, American No. 1.
Circular Saw Mill, Hossier Pony.
Circular Resaw, 44", heavy type.
Jointer, Falls Machine Co., undercut 24", power feed.
Puzz Planer, 16 and 24".
Lathe, Back Knife Clement, 40".
Planer, 30", Fay & Egan Single Cabinet.
Dowell Machines, Hayes and Fay.
Dowell Gluer and Driver, E. B. Hayes.
Door Clamp, Hayes Standard Power.

Woodworking Machinery Company of Buffalo,
54 Mechanic St.,
Buffalo, N.Y.

FOR SALE

1—9-track Morgan No. 9-30" Open Back Nailer and Cleater.
2—9-track Doig No. 4 Closed Back Nailers and Cleaters.
1—6-track Grammes Cigar Box Nailer.
2—4-track Morgan No. 4 Plain Nailing Machines.
1—8-track Morgan No. 8 Plain Nailing Machine.
1—12-track Morgan No. 12 Plain Nailing Machine.
1—19 x 44" Connell & Dengler 2-col. Box Printer.
2—Fischer Box-Board Matchers.
1—Doig 2-head Corrugated Fastener Driver.
1—Woods No. 190 Power Feed Railway Cut-off Saw.
6—Hall & Brown Roller Carriage Cut-off Saws.
1—Chase-Turbine No. 245 Bottle Box Groover.
1—54" Berlin No. 284 Vertical Band Resaw.
1—Berlin No. 229 Double Cut-off Saw.
1—Hoosier Self-feed Rip Saw.

Box Machinery, Veneer Machinery, Woodworking Machinery of all kinds. Send us your inquiries.

Chas. N. Braun Machinery Co., Fort Wayne, Ind., U.S.A. 7-8

FOR SALE

Dowel and Skewer Machinery, also a couple of engines. Box 112, Canadian Woodworker, Toronto. 7-9

FOR SALE

New Time Recorder, numbered to 100; never been used. Apply Box 113, Canadian Woodworker, Toronto. 7-9

FOR SALE

Dovetail Box Machinery (St. Paul), complete set, good condition, cheap. J. L. Neilson & Co., Winnipeg. 8

Enlarges Scope of Engineering School.

Princeton has given an undergraduate course in civil engineering and a graduate course in electrical engineering for many years. Next fall undergraduate courses in mechanical, electrical, mining and chemical engineering will be added to the curriculum. A four-year course will lead to the degree of B. S. in engineering and is designed to meet the needs of the student who does not expect to practice the profession of engineering, but wishes the engineering training to fit him for business or manufacturing. For those who decide to follow engineering as a profession an additional year of special work in the chosen branch will bring the engineer's degree. The establishment of the new courses has been largely due to the efforts of certain of Princeton's engineering alumni through the graduate body known as the Princeton Engineering Association.

Prof. Arthur M. Greene will become head of the Princeton Engineering School in 1922.

Construction of National Road.

It is reported that work has been started on the construction of approximately 6 miles of improved surface roadway from the "Casino" at Panama City to Old Panama. The amount of the contract is approximately $275,000, and the work has been contracted to be completed in four to five months' time. The portion of the road from Panama City to the Sabanas is subjected to the greatest amount of traffic and is to be constructed of concrete. The remaining portion from the Sabanas to Old Panama is to be built of an asphalt wearing surface on a macadam foundation. The roadway will be about 20 feet in width. This is a continuation of the road-building program started by the Republic of Panama about the beginning of the present year, and is the third award which has been made since that time.

The Jamaican Government plans the improvement of Kingston harbor at a cost of $5,000,000, and hopes to attract the ships passing through the Panama Canal Vessels from New Zealand, Australia, Tasmania, and the ships of the Canadian Government Mercantile Marine coming to Jamaica have been exempted from tonnage and lighthouse dues from 1921 to 1923, inclusive.

INVESTIGATE IMMEDIATELY

We warrant the following used and rebuilt Wood Working Machines.

1 Woods 15 X 6" Planer & Matcher.
1 MacGregor 26 X 8" Double Surfacer.
1 Yates 30 X 6" Double Surfacer (rebuilt)
1 Smith 8" Sticker.
1 RogersNo. 6 R.H. Saw Sharpener (new)
1 Black Diamond No. 1 Saw Filer (new)
1 Ballantyne Self Feed Rip Saw
1 Jackson Cochrane 3 Drum Sander
1 MacGregor Mortiser
1 C.M.C. Sash Moulder 6"
1 C.M.C. 12" Buzz Planer
1 MacGregor Tenoner
1 Woods 24 X 6" Planer & Matcher
1 Smith 10"—4 side Moulder
1 New Britain Chain Mortiser
1 Greenlee Hollow Chisel Mortiser
1 Morgan No. 8—26" Nailing Machine, open back
1 Jackson Cochrane 12 spindle Dovetailer
1 Cowan 12" Buzz Planer
1 Bertrand 18" Buzz Planer

We solicit your inquiries.

M. E. Casey Co.
Limited
263 St. James St. Main 411
MONTREAL

END PILING OF MOULDING.

End storage ot moulding is becoming more popular, as it is claimed that this method has many distinct advantages over any other. A light tap of moulding stored on end will cause dust to slide off. Furthermore moulding so stored is more easily, quickly and cheaplyy handled, and a piece of any length can be picked out at a glance. The greatest objecton to end storage is that it is likely to cause more warpage than flat storage. Warpage in small storage is not serious, but warpege of heavier stock somtimes causes regrettable loss.

Warpage can be greatly lessened by proper piling and by seeing that the moulding is not slanted too much in the bins. In other words moulding should be stacked as nearly upright as possible. Warpage can be practically eliminated by bulding up solid backs for the moulding rack or even by running boards across to provide backing. Shiplap or ordinary sheeting lumber will do for this purpose.

It is very easwy to construct rack for the end storage of moulding provided sufficient space is available. The heght of the room must accomodate the longest lengths carried. For each pattern shere should be a separate bin or pocket. Usually bins two feet wide by six feet deep will be sufficiently large for an ordinary retail stock.

Whoile the end storage of moulding mitigates damage from dust, it is always best to store moulding in a dust proof-room equiped with doors opposite each mouldng alley. This room should be dry and well ventilated. Each bin should be numbered and beside each door on the outside these should be a sample of every moulding in the particular alley. Beside each samule should be set a bin number, so that it is possible to tell at a glance the bin in which any desired pattern is stored.

A GOOD BUSINESS POLICY.

The creed as adopted by the National Association of Purchasing Agents should not be confiined to members of any one organization but could be adopted and practised with profit by anyone engaged in any field of endeavour. In our modern business life too little attention is given to the ideals and feelings of others. Let us adopt a more tolerant attitude in all dealings with our fellow man.

I believe absolutely in honesty and sincerity—in thought, action and deed.

I believe it is my duty to elevate the standards of my profession by study and service.

I believe in the ideals embodied in the Golden Rule—"All things whatsoever that men should do unto you, do you even so unto them." Therefore, I believe in courtesy and good will toward all.

I believe in the "square deal" toward the company I represent, with myself, and toward the men with whom I do business.

I believe it is the duty to refuse and renounce gifts or perquisites from those with whom I transact business.

I believe in enthusiasm, progressive methods, and success; in the exchange of ideas and association among fellow purchasing agents and in fulfilling all my obligations like a man.

The safety valve that always passes a certain amount of steam requires "grinding-in."

Sidmans

Lumber Curing Kiln

Must Be The

Satisfactory Kiln

As there are more Sidman Kilns in operation in Canada than any other made, and NEARLY AS MANY as of ALL OTHER MAKES.

Our REPEAT ORDERS ALONE in the past two years have exceeded in number the **Combined Sales** of all other makes.

NO DUTY, NO EXCHANGE. MADE IN CANADA, by a Canadian Company. Money paid us for kilns is SPENT IN CANADA.

Let us send you a partial list of users and put you in direct touch with them.

The Sidmans of Canada

Lumber Curing Specialists

LONDON ONTARIO

Opportunity for Young Men in Big Business

Head of the Westinghouse Company Demonstrates How Hard Work Brings Results—The Example of Samuel Insull

Preparing oneself for opportunities to be ready when they come was the theme of the address of General Guy E. Tripp, chairman of the board of directors, Westinghouse Electric & Manufacturing Company, at the commencement exercises of the Westinghouse Technical Night School a few weeks ago. He told how one man prominent in the electrical industry, Samuel Insull, took advantage of learning more by doing more work, and what resulted from his effort. General Tripp said further:

"There never was a time when such a young man with loyal instincts had so many opportunities as at the present time.

"I have spent many hours on different occasions in conference with others trying to select young men for responsible positions both within my own company and outside. It is more difficult to find such men than you imagine.

"In the first place, while we know that there are many of them, we unfortunately do not know who they are. They have not yet attracted wide enough attention to be known beyond a comparatively small circle.

"Then, again, there are too many who have got a wrong start, a wrong attitude of mind, whose daily actions are based solely upon selfish considerations. However able such a young man may be, those who are responsible for the selections for important positions fear to run the risk that he would change his outlook upon life and become loyal to a trust for others; there much ability is wasted in unsuccessful and ultimately discontented men.

"However, these are all generalities and it doesn't do to generalize too much. When all is said, the fact remains that men usually select themselves for higher positions and I can best illustrate that by reading to you from an interview by Mr. Samuel Insull of Chicago, who is not only the dean of the electric light and power industry, but is also one of the outstanding successful men of America. Mr. Insull began his business life in London and he describes his own experience as follows:

" 'I had answered a "blind" advertisement, and, as a result, had secured a position as secretary to Mr. Edison's business representative in London. I had come into the business without any knowledge of either the technical or the commercial side of it.

" 'What prepared me rather quickly for a better place, and attracted the attention and support necessary to get it, were two pieces of work outside of my regular duties.

Chances for Advancement.

" 'The first chance came only a few weeks after I had taken the job, when my chief sailed for the United States and left me behind. There was not much to be done in the office, and I might have had most of my time free. In fact, it was expected that I would. But thanks to an immense curiosity about the business, I didn't; I stayed in the office and read, and re-read, every document I could lay my hands on.

" 'When the chief came back I was able to supply him with information on current affairs and even on things which had occurred before I came with the business. And I could relieve him of more work than he had expected I could. It had all come about in the simplest possible way, that would have been open to anyone; yet it made a considerable impression on him.

" 'The second outside task—of course, there were other smaller ones in between—came a year or so later. Mr. Edison's technical representative in London was getting out a report on electrical developments in England and on the Continent. He wanted a stenographer to work with him evenings, for perhaps two months, and he asked me if I couldn't find one for him.

Hard Work Brought Results.

" 'By this time I had become fairly well informed on the commercial side of the business, but on the technical side I was still pretty ignorant. It struck me that here was my opportunity to brush up on that side, and I volunteered for the job.

" 'It was hard work. It kept me busy often until midnight, on top of unusually active days, as it turned out. But it brought quick results.

" 'This is they way they developed. The technical man went to New York with his finished report. While he was away he wanted someone in the London office to keep posted on certain European properties in which he was interested, and to send him weekly reports. I was chosen to do it. I was chosen simply because of my familiarity with the properties, and with the requirements of this technical man, which I had gained from my evening sessions with him as a stenographer.

" 'In the ordinary course, the weekly reports were shown by the technical man to Mr. Edison. There was nothing elaborate or difficult about them. They were simple compilations of certain data, which my work with the technical man had made it easy for me to prepare. But they showed a familiarity with the properties, and with other details of the business, that Mr. Edison liked. It happened that he himself was needing a secretary at the time. He asked the technical man about me, and then sent for me.

" 'You see how directly one of the unnecessary tasks brought the opportunity; how the two of them together had prepared me for it; and how impossible the opportunity would have been but for my undertaking those tasks, no matter what sort of natural ability I might have had. As a matter of fact, the real opportunity was not the call from Mr. Edison, but the chance at those bits of outside study and work. And there are similar opportunities opening up from every job.

" 'I found them again when I became Mr. Edison's secretary, although it was not so easy to take advantage of them. The actual requirements of the work were stiffer. The night I landed in New York—I got there about six in the evening—I called on Mr. Edison immediately, and worked straight through with him until four in the morning.

" 'That was unusual; but even under ordinary conditions there was a good deal of overtime work. Mr. Edison was as likely to be in his laboratory at midnight as at midday. Often the most convenient time for him to attend to his business affairs was after he had finished in the laboratory. It was not uncommon for me to spend the day in the office in New York and then go down to his home at Menlo Park, in New Jersey, for a session with him at almost any hour of the night.

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In using *"Steelgrip"* CLAMP NAILS
only the ordinary machine work is required. Cut a slot, drive in a "Steelgrip," that's all. No clamping, no waiting for glue to set.

***"Steelgrip"* CLAMP NAILS**
Save Time + Labor = Money
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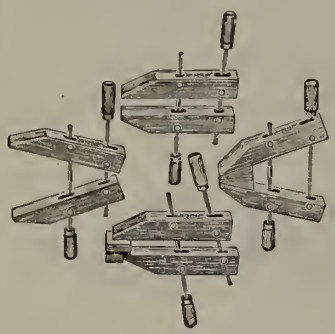
CIRCULARS and SAMPLES ON REQUEST.

"Pony" Cabinet Clamp

For lightness combined with strength this clamp has no equal. All parts are selected from the best materials obtainable and we have spared no effort to make the "Pony" the finest thing of its kind on the market. Made in sizes to open 18 in. to 72 in.



"Jorgensen"

Peerless Adjustable Hand Clamp

Fits every grip without a slip and takes a tighter hold with less effort. It is a tool of real economy and a clamp that insures efficiency.

Adjustable Clamp Company

216 N. Jefferson St., Chicago, U.S.A.

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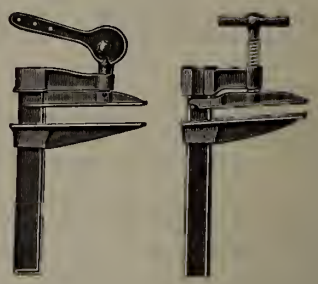
Colt's Clamps

for the

Woodworker



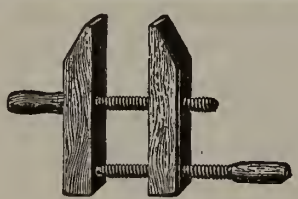
Colt's Universal and Vise Clamps are unsurpassed for the Furniture Manufacturer and General Woodworker. They are made right, both in design and quality of materials and workmanship.

Colt's Clamps are quick-acting and have broad jaw clamping surface.

For further information write for Catalogue No. 294.

Batavia Clamp Co.

235 Centre St. **BATAVIA, N.Y.**



Cabinet Makers' Benches, Clamps and Hand Screws

Manufactured by

C. CHRISTIANSEN

2814 W. 26th St. **CHICAGO, ILL.**

Better work follows the use of the "Empire"

There is no question about it. EMPIRE all steel clamps do the work with less chance of failure than any other you can purchase. In scores of shops where they are in daily use results bear out the truth of this statement. If you will try them once you will be convinced.

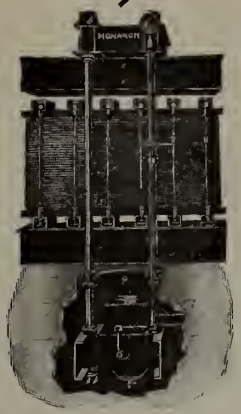
Get in touch with us now. We can make prompt delivery from stock.

We specialize in all types of woodworking tools.

Empire Tool Works

Toronto - Ontario

Farquhar Hydraulic Machinery



Monarch Veneer Presses

Farquhar Hydraulic Veneer Presses have double steel head and base, and heavy steel strain rods. Cylinder, which is of steel with detachable saddle, can be repacked without removing the ram. Pump is quick acting, of rigid construction. A pressure of 100-lbs. to the square inch is applied to the veneering surface. Stock is handled by retainer system, unsurpassed both for efficiency and economy.

These presses are built to suit all requirements, liberal proportions with first quality material and workmanship throughout.

We make a specialty of Pumps, Accumulators, Etc. Also all kinds of special Hydraulic Presses and equipment to order. Write us concerning your requirements.

A. B. FARQUHAR CO., Limited, Box 171, York, Pa.

THE SLIDE IS THE HEART OF YOUR EXTENSION TABLE

If the Slide Does Not Work properly Your Whole Table is Condemned

Wabash Slides insure Satisfied Customers

SLIDE MAKING is a SPECIALTY BUSINESS

We can Furnish Better Slides for Less Cost

Eliminate Slide Troubles by using WABASH SLIDES

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B. Walter & Company

Edsall St., Wabash, Ind.

"The Phillips Line"

Window Frame Machines

This is the work ☞

Let us tell you about the machine.

Testimonials from hundreds of satisfied users.

F. V. Phillips invented and built window frame machines for 40 years. "The Phillips Line" is the culmination of his efforts.

Your inquiries solicited.

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There is supreme satisfaction in Garnet Cloth and Paper you can believe n - which you know will run true and smooth, giving a finish that every good workman demands.

Carborundum Brand Garnet Paper and Cloth

are made of the very best material coated with North River Garnet which cuts fast and uniform.

A complete stock of sheets and rolls in all standard widths and grades carried here.

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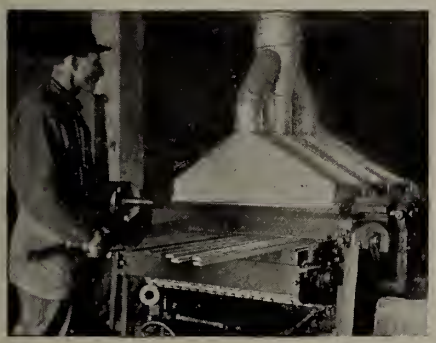
The Cleanliness and Purity of Carborundum Brand Garnet



GARNET grain must be clean and pure. It must be free from dust, dirt, iron and other impurities. If it isn't, your garnet paper or cloth fills up—it clogs. The result is that it cuts slowly, leaves a most uneven finish.

Carborundum Brand Garnet is clean—it's pure—it's uniformly graded. There is no dirt—no impurities—no fines. That is why Carborundum Brand Garnet Paper and Cloth cut so clean, so fast, and show such long life. Other reasons are found in the fact that the backing is of the highest quality—the glue of the best grade—the method of manufacture the most modern and approved.

Carborundum Brand Garnet Paper and Cloth

Will Make Good Sanders Better Sanders

THE CARBORUNDUM COMPANY, NIAGARA FALLS, N. Y.

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The "Canadian Woodworker" Buyers' Directory

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Canada Machinery Corporation, Galt, Ont.
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Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
McKnight & Son Co., L. G., Gardner, Mass.
Nash, J. M., Milwaukee, Wis.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Reynolds Machine Co., Massillon, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

BOX BANDS
Cary Mfg. Company, Brooklyn, N.Y.
Laidlaw Bale-Tie Co., Hamilton, Ont.

BOX MAKERS' MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Morgan Machine Co., Rochester, N.Y.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
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BUTTONS
Canadian Buttons Limited, Montreal
Rowe Mfg. Co., Newaygo, Mich.

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Cowan & Company, Galt, Ont.
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Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

CANE WEBBING
Overseas Reed and Cane Co., Ionia, Mich.

CARVING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.

CASTERS
Foster, Merriam Co., Merriden, Conn.

CHAIR MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

CIRCULAR SAWS
Atkins & Co., E. C., Indianapolis, Ind.

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Batavia Clamp Company, Batavia, N.Y.
Billstrom Nels J., Rockford, Ill.
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Canada Machinery Corporation, Galt, Ont.
Christiansen, C., Chicago.
Cowan & Company, Galt, Ont.
Empire Tool Co., Toronto, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Preston Woodworking Machinery Company, Preston, Ont.
Taylor Mfg. Co., Jas. L., Poughkeepsie, N.Y.

CLAMP CARRIERS
Taylor Mfg. Co., Poughkeepsie, N.Y.

CLAMP NAILS
Clamp Nail Co., Chicago.

CORRUGATED FASTENERS
Cary Mfg. Company, Brooklyn, N.Y.

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Lloyd, W. Y., Toronto, Ont.
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Mackenzie Machinery Co., D., Guelph, Ont.

CUT-OFF SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

CUSHIONS
Cumfy Cushion Co., Toronto, Ont.

CUTTER HEADS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Mattison Machine Works, Rockford, Ill.
Shimer Cutter Head Co., Galt, Ont.
Yates Machine Co., P. B. Hamilton, Ont.

CYLINDER HEADS
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.

DOOR CARRIERS FOR DRY KILNS
Dry Kiln Door Carrier Co., Indianapolis, Ind.

DOVETAILING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

DOWEL MACHINES
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.

DOWELS
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Canadian Blower & Forge Co., Kitchener, Ont
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DUST COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

DUST SEPARATORS
Canadian Blower & Forge Co., Kitchener, Ont.

EDGERS (Single Saw)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.

EDGERS (Gang)
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

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Atkins & Co., E. C., Hamilton, Ont.

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Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont
Yates Machine Co., P. B., Hamilton, Ont.

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Canadian Blower & Forge Co., Kitchener, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.

EXHAUST SYSTEMS
Canadian Blower & Forge Co.
Neville-Cooper Co., Toronto.

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Grand Rapids Fibre Cord Co., Grand Rapids.

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Atkins & Co., E. C., Hamilton, Ont.

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Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

FURNITURE LEATHER
Eagle-Ottawa Leather Co., Grand Haven, Mich.
Mechanical Leathers, Ltd., Toronto.

FURNITURE TRIMMINGS
Foster, Merriam Co., Meriden, Conn.

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Carborundum Co., Niagara Falls, N.Y.
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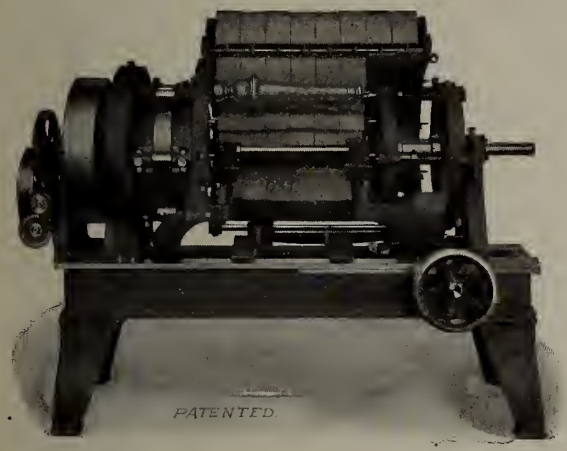

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If not, I can show you a way to save money and get better results.

Isn't that what you are looking for? Just drop a line to

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Manufacture the Best

PLANER KNIVES and CUTTERS

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A KILN is as GOOD as its PROCESS— plus its EQUIPMENT— plus the SERVICE of the MAKER— plus the ORGANIZATION back of it all—

OUR PROCESS assures the control of the three fundamental factors—HEAT—HUMIDITY—CIRCULATION.

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OUR SERVICE is the broadest—engineers for layouts, building designs and operation—superintendents for erection and installation—experienced woodworkers for consultation and service during the life of your kiln.

OUR ORGANIZATION has been composed of woodworkers for thirty-five years, men who know wood and have handled it through the complete range of manufacturing operations.

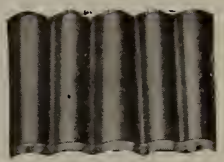
GRAND RAPIDS VAPOR KILN

GRAND RAPIDS, MICHIGAN

WESTERN VAPOR KILN CO. SEATTLE, WASH

Cary's SUPERIOR QUALITY Corrugated Fasteners

SAW EDGE



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According to final decision, after long litigation, we have been granted the SOLE RIGHT to manufacture a Saw Tooth Corrugated Fastener with a continuous cutting edge. Our fastener is beveled evenly on both sides, which enables fasteners to be driven in straight, and much easier than any other fastener made. Our Corrugated Fastener is made in various widths and corrugations, also in coils wound right and left. Try our products and you will use no other.

Samples and prices on request.

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GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GLUE
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Sampson & White, London, England.

GLUE CLAMPS
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane, & Company, Kitchener.
Taylor Mfg. Co., Jas. L., Poughkeepsie, N.Y.

GLUE HEATERS
Fay & Egan Co., J. A., Cincinnati, Ohio.
International Electric Co., Indianapolis, Ind.
Jackson, Cochrane, & Company, Kitchener.
Oliver Machinery Co., Grand Rapids, Mich.
Pringle, R. E. T., Toronto, Ont.

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Casey Co., M. E., Montreal, Que.
Jackson, Cochrane & Company, Kitchener, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GLUE SPREADERS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener.

GLUE ROOM EQUIPMENT
Perrin & Company, W. R., Toronto, Ont.

GRINDERS (Cutter)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

GRINDERS (Knife)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co.. Toronto. Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co.. P. B.. Hamilton. Ont.

GRINDERS (Tool)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener, Ont

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GROOVERS
Atkins & Co., E. C., Hamilton, Ont.

GROOVING HEADS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Mattison Machine Works, Rockford, Ill.

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Aberdeen Lumber Co., Pittsburg, Pa.
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Sondheimer Co., E., Memphis, Tenn.

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Weber-Knapp Co., Jamestown, N.Y.

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Colborn, C. B., Memphis, Tenn.

HARDWOOD LUMBER
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American Hardwood Lumber Co., St. Louis, Mo.
American Oak Mfrs.' Assn., Memphis, Tenn.
American Walnut Association, Washington, D.C.
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Anderson, Shreiner & Mawson, Toronto, Ont.
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Barr- Holaday Lumber Co., Greenfield, Ohio.
Barlett Lumber Co., W. C., Charleston, Va.
Bedna Young Lumber Co., Jackson, Tenn.
Biglow-Cooper Co., Bay City, Mich.
Bonner & Sons, J. H., Memphis, Tenn.
Brown Bros. Co., New York.
Brown & Company, Geo. C.
Bruce Co., E. L., Little Rock, Ark.
Burns & Knapp Lbr. Co., Conneautville, Ohio.
Bury & Company, Robert, Toronto. Ont.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Colborn, C. B., Memphis, Tenn.
Conkling Lumber Co., Frank A., Memphis, Tenn.
Canadian General Lumber Co., Toronto, Ont.
Chicago Mill and Lumber Co., Chicago, Ill.
Clark & Sons, Edward, Toronto.
Dacus-Richards Hardwood Co., Memphis, Tenn.
Darnell-Love Lumber Co., Leland, Miss.
DeHewit Lumber Co., Huntington, Va.
Dooley Lumber Co., F. T., Memphis, Tenn.
Evansville Band Mill Co., Evansville, Ind.
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Gayoso Lumber Co., Memphis, Tenn.
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Mengel Co., Louisville, Ky.
Merceau-Hawkins Tie Co., Huntington, W.Va
Mowbray & Robinson, Cincinnati, Ohio.
Murrelle Lumber Company, Memphis, Tenn.
Nicholson & Co., E. M., Montreal, Que.
Nichols & Cox Lumber Co., Grand Rapids, Mich.
Otis Mfg. Co., New Orleans, La.
Paepcke Leicht Lumber Co., Chicago, Ill.
Payson, Smith Lumber Co., Minneapolis, Minn.
Pedwell Hardwood Lumber Co., Toronto, Ont.
Perkins Bros., Kelso, Ark.
Peytona Lumber Co., Huntington, W. Va.
Pickrel Walnut Co., St. Louis, Mo.
Powe Lumber Co., Thos. E., St. Louis, Mo
Rush Lumber Co., Memphis, Tenn.
Sawyer Goodman Co., Marinette, Wis.
Sondheimer Co., E., Memphis, Tenn.
Spencer, C. A., Montreal, Que.
Spotswood & Son, E. R., Lexington, Ky.
Stark & Co., Jas. E., Memphis, Tenn.
Stimson Hardwood Co., J. V., Memphis, Tenn.
Stimson & Co., J. V., Owensboro, Ky.
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Tennessee Lumber & Coal Co., Cincinnati Ohio.
Thompson, Katz Lumber Co., Memphis, Tenn.
Thompson & Co., Lewis, Philadelphia, Pa.
Upham & Walsh, Chicago, Ill.
Vail Cooperage Co., Fort Wayne, Ind.
Warren-Ross Lumber Co., Jamestown, N.Y.
Whiting Co., Wm. S., Johnson City, Tenn.
Wisconsin Lumber Co., Chicago, Ill.
Wayne Lumber Co., New York
Wood Mosaic Co., Louisville, Ky.
Yellow Poplar Lumber Co., Coal Grove, Ohio.

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INSURANCE
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KNOBS
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Rowe Mfg. Co., Newaygo, Mich.

JOINTERS
Canada Machinery Corporation, Galt, Ont.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

KNIVES (Planer and others)
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

LATHES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochane & Company. Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie. H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

LEATHER (Artificial)
Fibro Mfg. Company, Beverly, N. J.
Mechanical Leathers, Ltd., Toronto.

LEATHER CLOTH
Zapon Leather Cloth Co., New York.

LUMBER MEASURER
Durant Mfg. Co. Milwaukee, Wis.

MACHINE KNIVES
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company. Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Peter Hay Knife Company, Galt, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont

MIRRORS
Chicago Mirror & Art Glass Co., Chicago, Ill.

MITRE SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co.. Toronto. Ont
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.

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Mummert-Dixon Co., Hanover, Pa.
Oliver Machinery Co., Grand Rapids, Mich.

PANELS
Algoma Panel Co., Algoma, Wis.
Gorham Bros., Mount Pleasant, Mich.
Hardwood Products Co., Nennah, Wis.
Hay & Co., Woodstock, Ont.
Roberts, Geo. G., Chicago, Ill.
Waetjin & Co., L., Milwaukee, Wis.

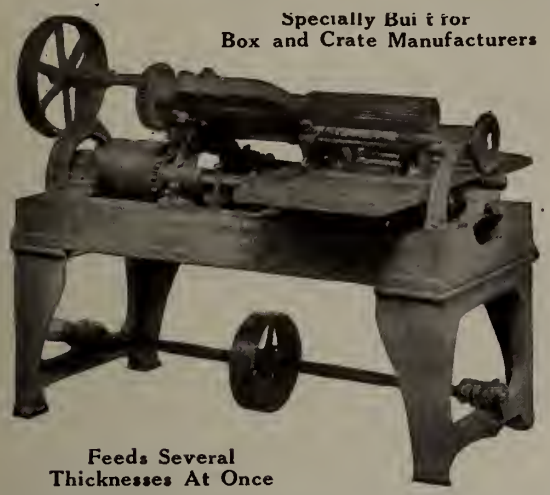
PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PERIOD MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich.

PERIOD TURNINGS
Decorators Supply Co., Chicago, Ill.

"The Chattanooga" — Just Another Name For Fast, Economical Gang Ripsawing

Specially Built for Box and Crate Manufacturers



Feeds Several Thicknesses At Once

This latest improved gang ripsaw is powerful, fast, safe and eliminates wastage. For gang sawing boards into strips or head sticks and for ripping veneers it is unsurpassed.

Has powerful feed and securely holds down and feeds short pieces. The feed rolls are automatically adjustable to varying thicknesses. Upper rolls are driven by cut gears, and the lower ones by sprocket chain. Several thicknesses of veneering can be fed thru machine at one time.

The CHATTANOOGA is an unusually big producer, easily operated, and turns to profitable account short stuff lying around a mill—otherwise wasted.

Attractive price. Complete information on request

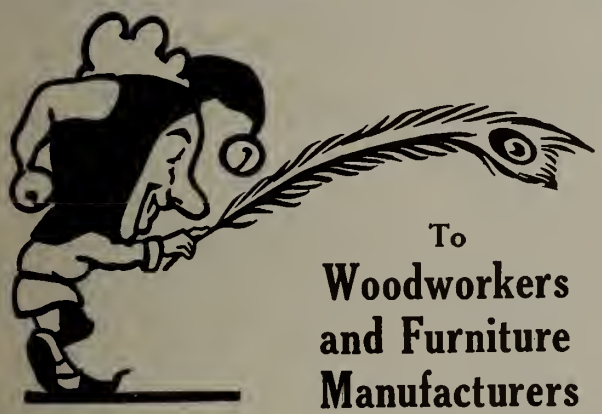
Chattanooga Machinery Company
Chattanooga, Tenn.

We Manufacture a complete line of

Chair, Cane-Cutting and Bending Machines

CUTS AND CATALOG UPON REQUEST

L. G. McKnight & Son Co.
GARDNER, MASS.



To **Woodworkers and Furniture Manufacturers**

Your requirements in Reed Forms for Wicker Work Furniture, Mechanic's Tool Cases, Dowels, Novelties, Cedar Chests, Piano Lamps, Table Lamps, etc., can be promptly supplied by us.

We are always pleased to quote prices and give any information you may desire. Try us on your next order.

THE
Brantford Pattern Works
BRANTFORD

New and Used Woodworking Machinery

WE CAN SAVE YOU MONEY

Look over our PARTIAL LIST and if you do not see your requirements there—WRITE—WIRE—or—PHONE US:

1—Automatic Knob Machine.
1—Jig Saw, Goldie McCulloch.
1—Jig Saw, McGregor Gourlay, Wood Top.
1—Double Disc Sander, American, 36″.
2—Hand Screw Veneer Presses, 38″—3 Screw American.
1—Gravity Swing Cut-off Saw, McGregor Gourlay.
1—12″ Moulder, Cowan & Co., 4-sided.
1—16″ Buzz Planer, Clark-Demill.
1—36″ Preston Band Saw.
1—28″ Band Saw.
1—7″ Moulder, Cowan & Co., 3-sided.
1—Sash Sticker, H. W. Petrie.
1—Double Surfacer, C.M.C., No. 212—30″.
1—Dowelling Machine, M31, Cowan & Co., No. 2, Cap. up to 2½″.
1—Planer and Matcher, S. A. Woods, 15″ x 6″.
1—Double Exhauster, 45″, American Blower Co.

Also a Full Line of Transmission Supplies

General Machinery Company
67-69 Frederick St., Toronto
TELEPHONE MAIN 2200

"Canadian Woodworker" Buyers' Directory—Continued

PLANERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLANING MILL MACHINERY
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Mattison Machine Works, Rockford, Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PRESSES (Veneer)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Jackson, Cochrane & Company, Kitchener, Ont.
Perrin & Co., Wm. R., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

REED
Carter & Co., E. T., Toronto, Ont.
Overseas Reed and Cane Co., Ionia, Mich.

REED MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

RESAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

RIM AND FELLOE MACHINERY
Defiance Machine Works, Defiance, Ohio.
Fay & Egan Co., J. A. Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mackenzie Machinery Co., D., Guelph, Ont.
Mattison Machine Works, Rockford. Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

ROSETTES
Waddell Mfg. Co., Grand Rapids, Mich.

RUBBING MACHINES
DeVilbiss Mfg. Co., Toledo, Ohio.
Mattison Machine Works, Rockford, Ill.

SAFETY DEVICES
Cowan & Company, Galt, Ont.

SANDERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SASH, DOOR & BLIND MACHINERY
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SAWS
Atkins & Co., E. C., Hamilton, Ont.
Disston & Sons, Henry, Toronto, Ont.
Radcliff Saw Mfg. Company, Toronto, Ont.
Seibert & Co., Louis, Cincinnati, Ohio.
Shurly-Dietrich, Ltd., Galt, Ont
Simonds Canada Saw Co., Montreal, Que.

SAW SHARPENERS
Hooker & Son, O. V., St. Johnsbury, Vt.
Oliver Machinery Co., Grand Rapids, Mich.

SAW SWAGES
Atkins & Co., E. C., Hamilton, Ont.
Cowan & Company, Galt, Ont.
Crowel, D. J., Buffalo, N. Y.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.

SAW TABLES
Canada Machinery Corporation, Galt, Ont. ..
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SCRAPING MACHINES
Canada Machinery Corporation, Galt, Ont. ..
Garlock-Walker Machinery Co., Toronto, Ont.
Whitney & Sons, Baxter D., Winchendon, Mass.

SCREW DRIVING MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.
Reynolds Machine Co., Massillon Ohio.

SCROLL SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont. ..
Casey Co., M. E., Montreal, Que.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Jackson, Cochrane, & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamiltonfi Ont.

SECOND-HAND MACHINERY
Casey, M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Osborne Sexton Machinery Co., Columbus, O.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Woodworking Machinery Co. of Buffalo, Buffalo, N.Y.

SHAPERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Sons, Baxter D., Winchendon, Mass
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SHAVING COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

STAINS
Ault & Wiborg, Toronto, Ont.
Williams Bros. & Co., Hounslow, Eng.

SINGLE SPINDLE BOXING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

STAVE SAWS
Atkins & Co., E. C., Hamilton, Ont.

STAVE SAWING MACHINE
Whitney & Son, Baxter D., Winchendon, Mass

STEEL DOOR MATS
Cary Mfg. Company, Brooklyn, N.Y.

SURFACERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Yates Machine Co., P. B., Hamilton, Ont.

SWING SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Eaglesfield, R. D., Indianapolis, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE LEG LATHES
Fay & Egan Co., J. A., Cincinnati, Ohoa.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE SLIDES
Jefferson Woodworking Co., Louisville, Ky.
Walter & Company, B., Wabash, Ind.

TEMPERATURE REGULATORS
Canadian Powers Regulator Co., Toronto, Ont.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Compan, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TIME CLOCKS
International Business Machines Co., Toronto, Ont.

TOPS
Gorham Bros., Mount Pleasant, Mich.

TRIMMERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Pretson, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TRUCKS
Cowan Truck Company, Toronto, Ont.
National Dry Kiln Co., Indianapolis, Ind.
Oliver Machinery Co., Grand Rapids, Mich.

TURNED WOOD GOODS
Algoma Wood Products Co., Algoma, Wis.
Canada Wood Specialty Co., Orillia, Ont.
Rowe Mfg. Co., Newaygo, Mich.

TWINES & WEBBING
Doon Twines, Ltd., Kitchener, Ont.

MORGAN
NAILING MACHINES

Are built strongly for heavy continuous service. Machines adapted to all kinds of special nailing.

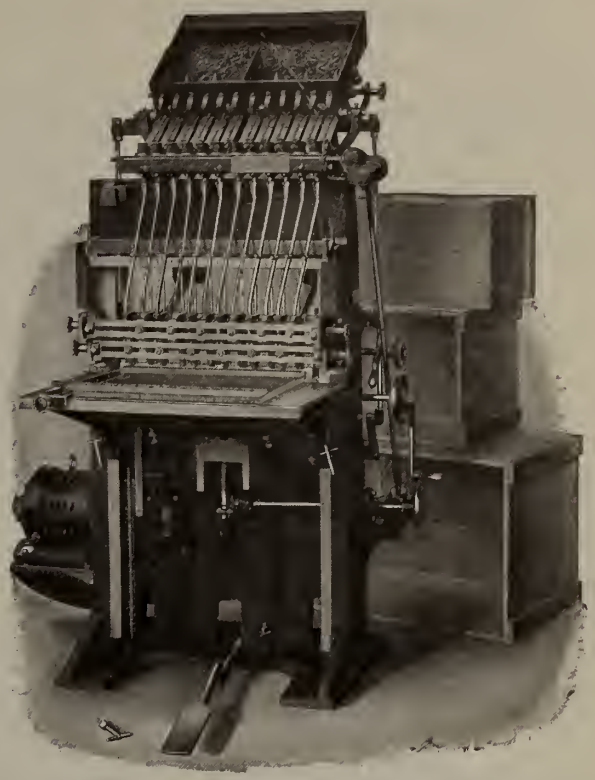
Regular machines for all sizes of boxes and crates.

Write us for descriptive literature.

Machines that save money

Morgan Machine Co.

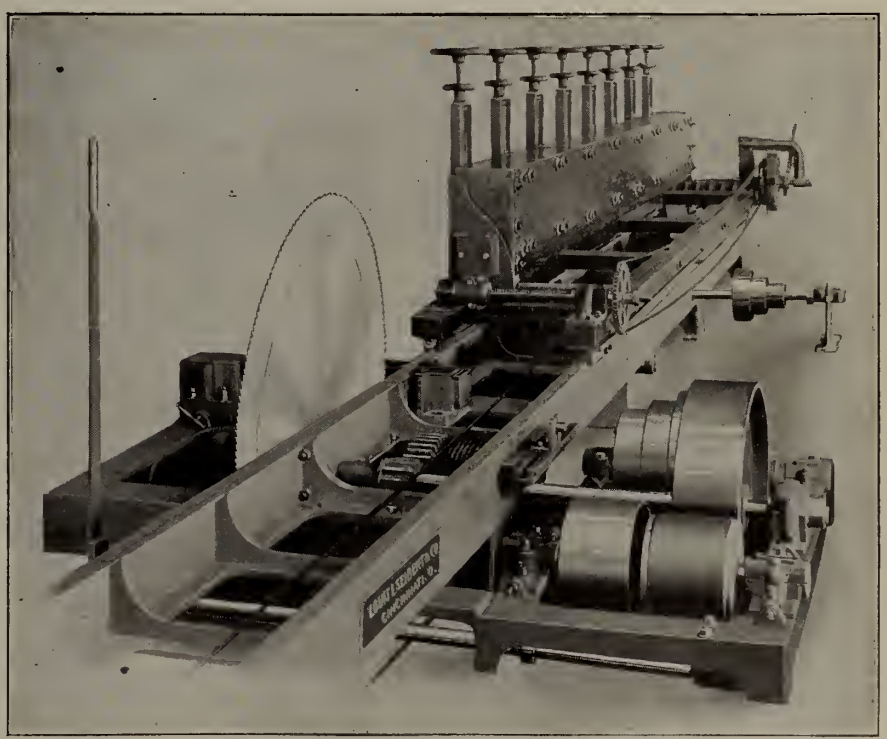
DEPT. A ROCHESTER, N.Y.



Morgan No. 12-30 Open Back Nailing Machine, Fitted with motor.

Veneer
and
Thin Lumber Saws

POSITIVE
AUTOMATIC
SET WORKS
AND
OFFSET



"A Mill Backed by Thirty Years' Progressive Experience."

Louis L. Seibert & Company, CINCINNATI, OHIO

"Canadian Woodworker" Buyers' Directory—Continued

VARNISHES
Adams & Elting Co., Chicago and Toronto.
Ault & Wiborg Company, Toronto. Ont.
Penfound Varnish Co., Toronto, Ont.

VARNISH DRYERS
Nicholls Co.. A. S., New York, N.Y.

VARNISH SPRAYERS
DeVilbiss Mfg. Co., Toledo, Ohio.
Paasche Air Brush Company, Chicago, Ill.

VENEERS
Batesville Lumber & Veneer Co., Lawrenceburg, Ind.
Birds Eye Veneer Co., Escanaba, Mich.
Bury & Compny, Robert, Toronto, Ont.
Central Lumber Co., Indianapolis, Ind.
Christmann Veneer & Lumber Co., St. Louis, Mo.
Curtis Co., C. E., Chicago
Dean Spicker Company, Chicago, Ill.
Empire Veneer Company, Chicago, Ill.
Evansville Veneer Co., Evansville, Ind.
Freiberg Lumher Co., Cincinnati, Ohio
Frye Lumber & Veneer Co., J. W., Dayton, O.
Hartzell, Geo. W., Piqua, Ohio.
Hoffman Bros. Company, Fort Wayne, Ind.
Holden, Henry S., Chicago, Ill.
Hardwood Prudocts Co., Neenah, Wis.
Korn-Conkling Co., Memphis, Tenn.
Long-Knight Lumber Co., Indianapolis, Ind.
Litton Veneer Co., Rockford, Ill.
Memphis Veneer & Lumber Co., Memphis, Tenn.
Mowhawk Veneer Co., Warren, Pa.
Munising Woodenware Co., Munising, Mich.
National Veneer & Lumber Co., Indianapolis, Ind.
North Vernon Lumber Co., North Vernon, Ind.
Northwestern Cooperage & Lumber Co., Gladstone, Mich.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod-Jurden Co., Memphis, Tenn.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Veneer Co., New Albany, Ind.
Roberts, Geo. G., Chicago, Ill.
Southern Veneer Mfg. Co., Louisville, Ky.
Stimson Veneer & Lumber Co., Memphis, Tenn.
Talge Mahogany Co., Indianapolis, Ind.
Thompson & Co., Lewis, Philadelphia, Pa.
Toronto Veneer Company, Toronto, Ont.
Veneer Manufacturers Co., Chicago, Ill.
Waetjen & Co., George L., Milwaukee, Wis.
The Williamson Veneer Company, Mills—Baltimore, Md. Sales Branches, New York, N. Y., Chicago, Ill., Jamestown, N.Y., High Point. N.C.
Warren Ross Lumber Co., Jamestown, N. Y.
Wood Mosaic Co., Louisville, Ky.

VENEER SAWS
Atkins & Co., E. C., Hamilton, Ont.

VENEER TAPE
Canadian Nashua Paper Co., Peterboro, Ont.
Gummed Products Co., Troy, Ohio.
Ideal Coated Paper Co., Brookfield, Mass.

VENTILATING APPARATUS
Canadian Blower & Forge Co., Kitchener, Ont.
Neville-Cooper Co., Toronto.

VENEER JOINTERS
Garlock-Walker Machinery Co., Toronto, Ont.

VENEER MACHINERY
Garlock-Walker Machinery Co., Toronto. Ont.
St. Joseph Iron Works, St. Joseph, Mich.

VENEER PRESSES (Hand and Power)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Perrin & Company, Wm. R., Toronto, Ont.

VISES
Fay & Egan Co., J. A., Cincinnati. Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WALNUT LUMBER
American Walnut Mfrs. Assn., Chicago.
Frye Lumber & Veneer Co., J. W., Dayton, Ohio.
Pickrel Walnut Company, St. Louis.
Porter, Frank R. Washington, D.C.
Purcell Walnut Lumber Co., Frank, Kansas City.

WINDOW FRAME MACHINE
Atlas Mfg. Co., Orlando, Florida.

WIRE
Laidlaw Bale-Tie Co.. Hamilton, Ont.

WIRE BOX STRAPPING
Cary Mfg. Company, Brooklyn, N.Y.

WOOD FINISHES
Ault & Wiborg, Toronto, Ont.
Penfound Varnish Co., Toronto, Ont.

WOODWORKING MACHINERY
General Machinery Co., Toronto, Ont.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOOD STAINS
Williams Brothers & Co

WOOD TURNING MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Yates Machine Co., P. B., Hamilton, Ont.

WORK BENCHES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOOD LATHES
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOODWORKING SPECIALTIES
Brantford Pattern Works, Brantford, Ont.

One Man Does the Work of Two
with a Billstrom Glue Clamp Carrier

For every plant where much edge-gluing is done there is a real need for a Billstrom.
Here's why:—

The empty clamp is held at just the right height for the greatest convenience of the workman.
When the clamp is filled he pulls a cord, which carries the filled clamp away and deposits an empty one in its place.
One man can accomplish as much by using it as two men can do employing the old methods.
It holds the work off the floor until the glue has set, when the glued stock can be quickly removed and piled flat, thus greatly conserving space.
It reduces the labor and cost of edge gluing to the minimum.
There is a sizs to suit your particular requirements.

N. J. BILLSTROM
2002 NINTH ST. ROCKFORD, ILL.

STARTED right with the finest nickel alloy steel and made mechanically right by expert saw makers Simonds Band Saws have long been recognized as leaders in woodworking shops. They hold their tension and retain their cutting edge longer.

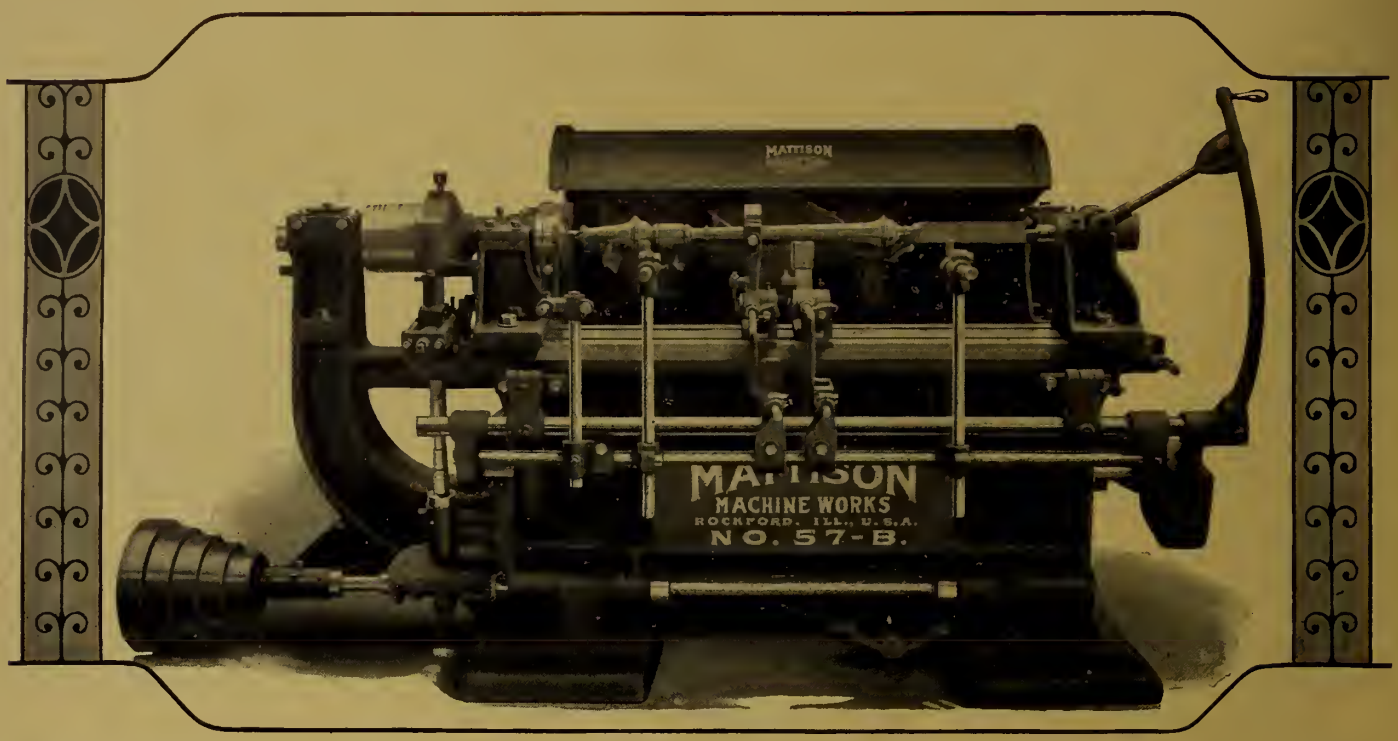
SIMONDS
BAND SAWS

Simonds Canada Saw Co., Ltd.

"The Saw Makers"

St. John, N.B. Montreal, Que. Vancouver, B.C.

MATTISON
Automatic
The Standard Shaping Lathe
OVER 3000 IN USE



New Styles Demand More Turnings

The Mattison Automatic Shaping Lathe produces turnings much faster and cheaper than is possible with hand methods or with old style machine equipment. But of even greater importance is its flexibility which gives your designer free play in creating his designs. It faithfully reproduces all the historic round, square and octagon turned work, which plays so important a part in the new, distinctive patterns of today

If it is worth while to bring out new patterns, isn't it just as important to give equal consideration to the best and most economical method of producing those patterns?

MATTISON
MACHINE WORKS
Rockford, Illinois, U.S.A.

Volume Twenty-One TORONTO, SEPTEMBER, 1921 Number Nine

CANADIAN WOODWORKER and Furniture Manufacturer

No. 613 Light Ripping and Jointing Saw.

Speed up your breaking out room. This machine will do the work of four hand feed machines and only take the same floor space as one.

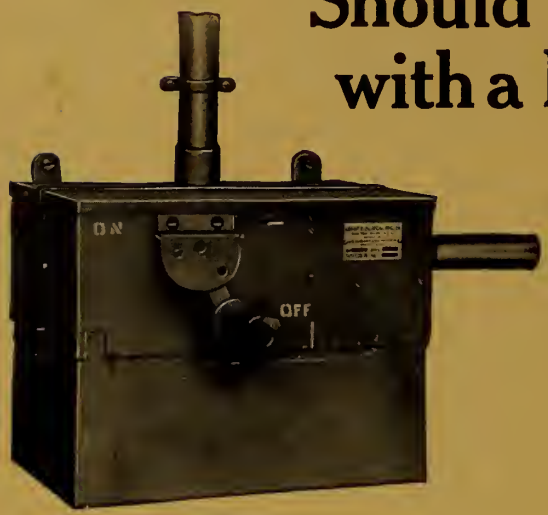
Rip your stock to a straight edge finish and give your workman protection from accident.

CANADA MACHINERY CORPORATION, GALT, ONTARIO
LIMITED

Toronto Sales Office - - 721-2 Bank of Hamilton Building.

CONDIT

No Power Circuit Should be Broken with a Knife Switch



Condit Type N-2 Oil Switch

Condit Type 1 Oil Starter

By using Condit Oil Starters and small industrial Oil Switches to protect small motors and small power and lighting circuits in woodworking plants, the fire hazard is eliminated and many delays caused by trouble with small motors not properly protected, is avoided. When a circuit is opened, the arc is under oil which immediately extinguishes it. Thus, serious trouble very often caused by knife switch blades burning in ways which prevent proper contact and allowing a three phase motor to operate on single phase, is obviated.

Our Nearest House can Supply You

Northern Electric Company
LIMITED

Montreal Halifax Quebec Ottawa Hamilton
Toronto London Windsor Winnipeg
Regina Calgary Edmonton
Vancouver

CONDIT: *the Synonym of Safety in Electrical Protective Equipment*

Andrew Carnegie says

in his autobiography:

"It is surprising how few men appreciate the enormous dividends derivable from investment in their own business. There is scarcely a manufacturer in the world who has not in his works some machinery that should be thrown out and replaced by improved appliances; or who does not, for the want of additional machinery or new methods, lose more than sufficient to pay the largest dividend obtainable by investment beyond his own demand."

If you need additional machine equipment or are i nterested in the latest improved machines, write us.

A few machines offered from stock are listed below:

1—McGregor-Gourlay Double Arbor Universal Saw Table, same as C.M.C. No. 618, with 14" saws, self-contained countershaft, full complement of gauges, saws, wrenches, etc.

1—Preston No. 127 Variety Saw Table, countershaft attached, one 14" saw.

1—Ballantine 36" Band Saw, with solid lower wheel, complete with saw blades, wrenches, etc.

1—Ballantine Two Spindle Shaper, Spindles 20½" centres, diameter of spindles where collars go on 1⅛", top 42" x 42".

1—American No. 1 Single Spindle Shaper. Fig. 937 with plain countershaft.

1—C. M. C. No. 507 Mortiser, with boring attachment.

1—C.M.C. No. 624 Hand Feed Rip Saw Machine, with self-contained counter shaft, table 6'6" long by 40" wide, with plain box gauge, 22" saw blades, 1¼" arbor with cone for receiving saws different diameter.

1—Ballantine 8" Four Sided Moulder, complete with square heads and straight knives on all heads.

1—American No. 2½ Single End Tenoner, with two copes and cut-off saw attachment. Fig. 9431 in American Woodworking Machinery Catalog.

1—C.M.C. No. 646 Roller Table Cut-off Saw, sliding table 7'6" long. stationary table 50" to the saw, sliding table equipped with stop gauge, including five stops, with countershaft, complete with saws, wrenches , etc.

1—Cowan Combination Vertical and Horizontal Boring Machine, complete with wrenches, etc.

1—Hespeler 12" Buzz Planer, fitted with round cylinder, full set of knives, countershaft, wrenches, guard, etc.

1—Preston 36" Band saw, lower web wheel and guards.

8—Sections Cowan Four Screw Veneer Press 12"x50", four sections 27" clear space under screw plates, four sections 32" under screw plates.

1—24" Francis Double Roll Glue Spreader.

4—Sections Cowan Three Screw Veneer Press 38"x12", 28" clear space under screw plates.

1—C.M.C. Arm Sander, No. 438, with paper cutter.

1—Universal Knife Grinder, 37", made by American Wood Working Machinery Co., Fig. 1126 in their catalogue.

1—60" Sturtevant Single Slow Speed Exhauster, left hand, top vertical discharge, complete with platform and rods to suspend from ceiling.

1—Cowan Chain Mortiser with grinder.

1—Ballantine 36" Band Saw, lower web wheel.

1—American No. 3 Double Cut-Off Saw, new machine, capacity from 8" to 6' 9" in length, 4" thick and 30" wide.

1—American No. 25 Edging and Ripping Saw, new machine.

1—American No. 30 Double Arbor Universal Saw Bench, new machine.

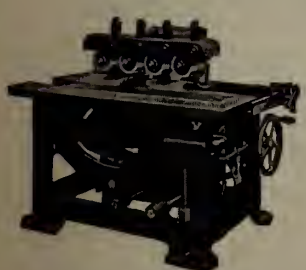
1—Preston 24" No. 121 Pony Planer, used only couple of months.

1—McGregor-Gourlay 24" Pony Planer.

1—Mershon Band Rip Saw.

SPECIALS

1—Morgan Two-Arm Shock Fastener, used machine, but in firstclass condition.
1—Used Morgan Eight-roll Box Board Matcher.
1—Used Morgan 12-spindle Double Row Chucks, Open Back Nailing Machine.



American No. 25 Power Feed Edging and Ripping Saw

Garlock-Walker Machinery Co., Limited

32 Front Street West

WINNIPEG TORONTO MONTREAL

Everything in Woodworking and Metal Working Machinery

American No. 2½ Single End Tenoning Machine

An Open Letter to Railroad Men on the No. 171 "Lightning" Timber Sizer

Facilitate the car shop with the new developments of this Sizer.

"The Lightning" Line
TRADE MARK REG.

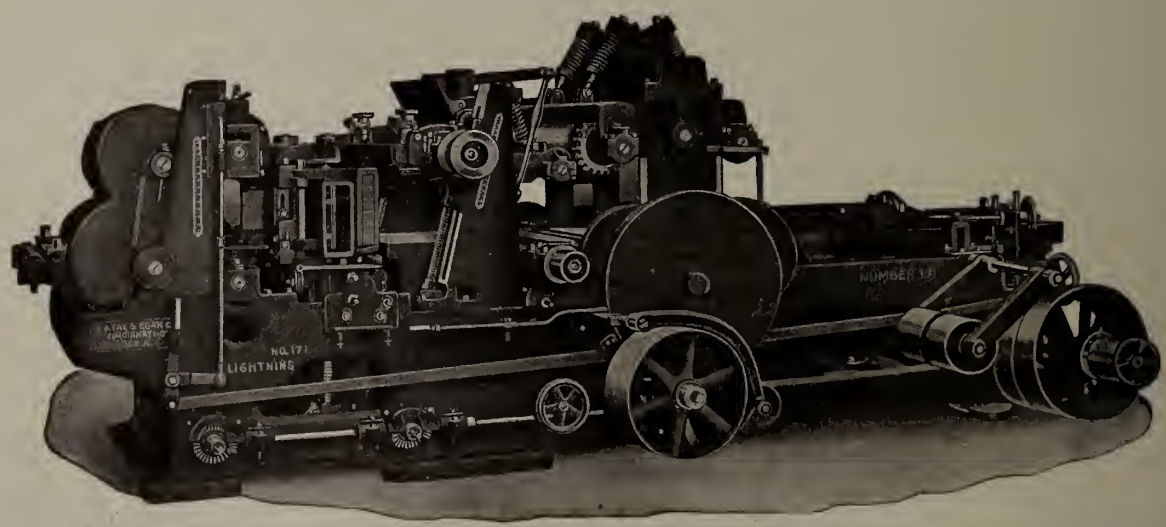
Mr. Railroad Man:

In order to meet the increased demands made upon your woodworking shops, production must be speeded up to the limit.

You cannot speed up production on an old-style Planer and Matcher. Discard that slow and out-of-date machine and install this new efficient fast-feed Planer, Matcher and Sizer.

Made to work 20″ or 30″ wide and 14″ thick. All adjustments are quickly and easily made, particularly in changing for different classes of work.

It will pay you to investigate this modern fast-feed tool.



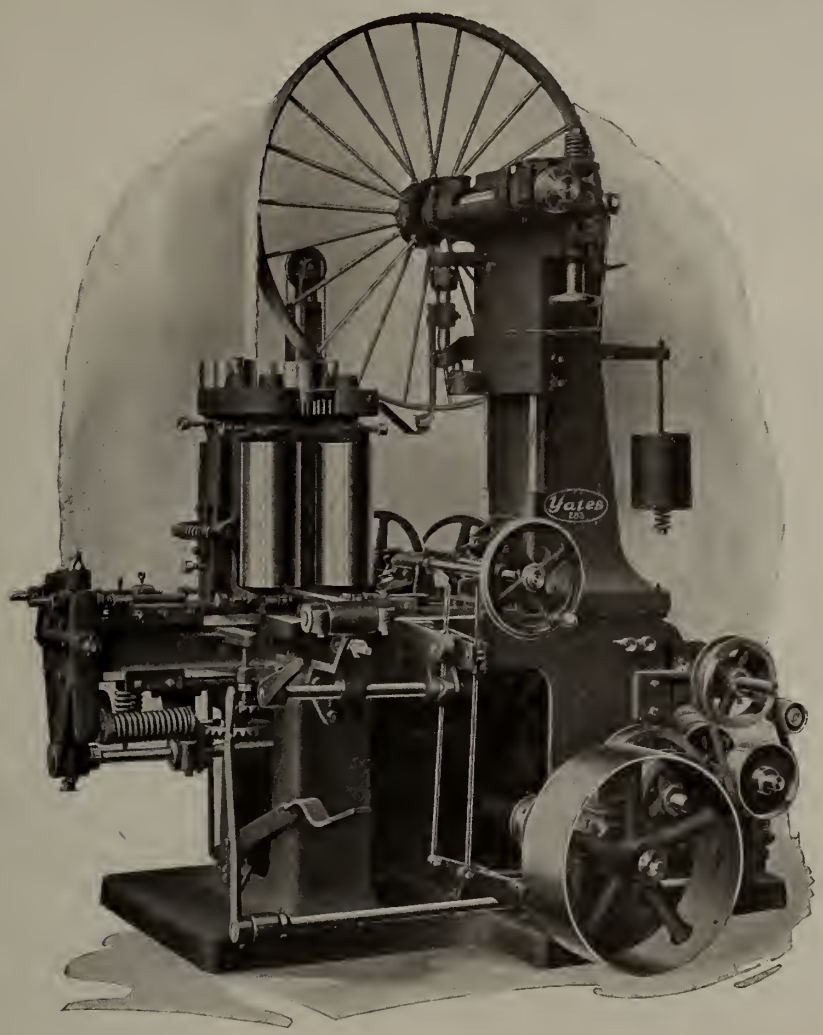
J. A. Fay & Egan Company

Established 1830

World's Oldest and Largest Manufacturers of Woodworking Machinery

153-173 W. Front St., CINCINNATI, OHIO

"Setting the Pace"



Yates

No. 283 Band Resaw

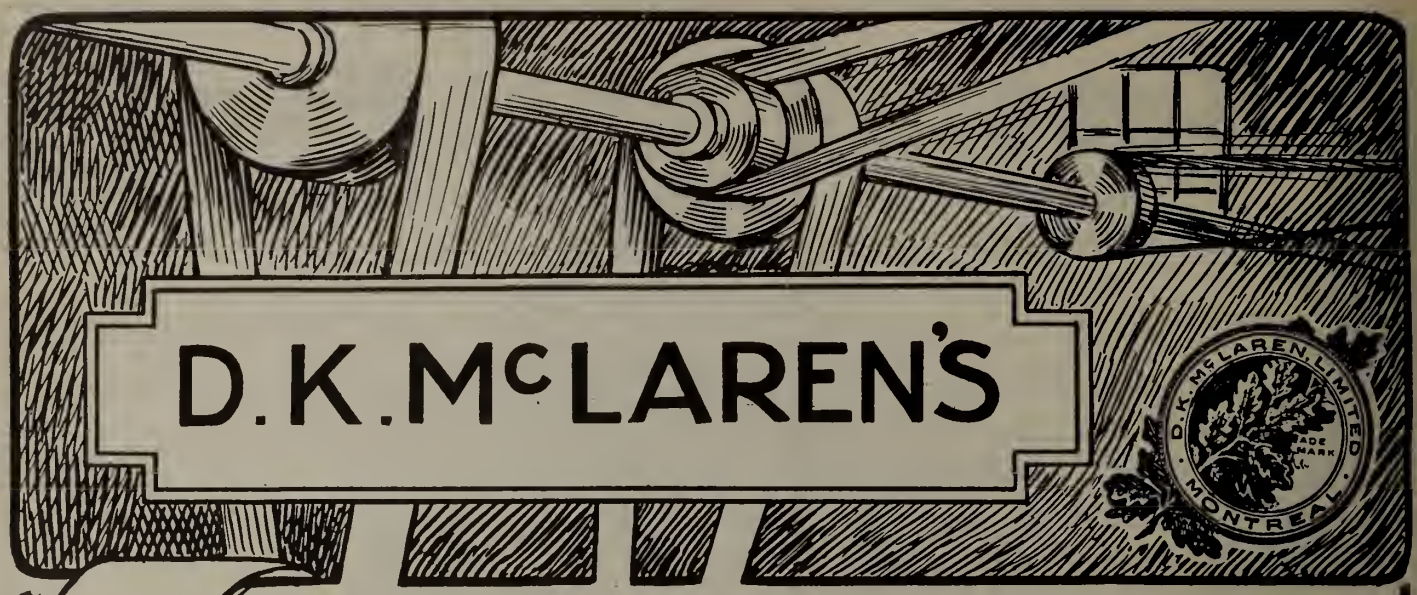
For Lighter Resawing in Furniture Factories

Where fine and accurate work is absolutely necessary the "283" for turning out this class of work has "set the pace" for many years. When it comes to "finish" it leads them all. One user says "The finish has been all that we could desire."

Have you seen the Yellow and Black Circular ?
Sent gladly upon request — No obligation.

P. B. Yates Machine Co. Limited

Hamilton - Canada



Genuine·British·Oak·Tanned LEATHER·BELTING

POWER is expensive-too expensive to waste. And yet that is what hundreds of belting users are doing when they employ a belt that is continually stretching and slipping.

The small difference in the cost of such a belt and D. K. McLAREN'S GENUINE BRITISH OAK TANNED LEATHER BELTING is quickly swallowed up in the wasted power for which the cheap belt is responsible.

Do not be misled. Cheap belts are not cheap. They are expensive. Let's talk it over!

D. K. McLAREN, LIMITED

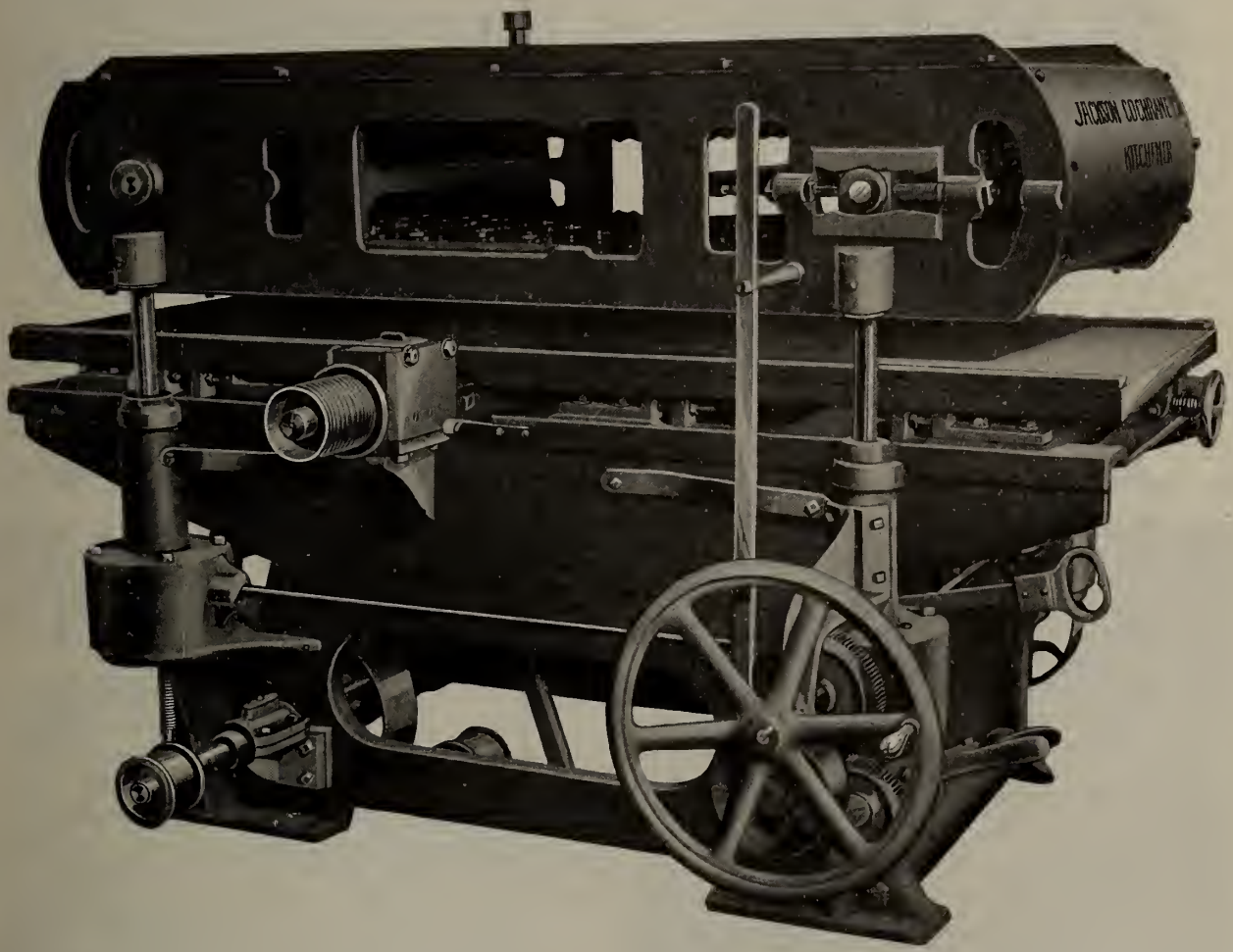
Head Office and Factory: 351 St, James Street Montreal, P. Q., Canada
TORONTO, ONT. 194 King St. West
ST. JOHN, N.B. 80 Germain Street VANCOUVER, B.C. 334 Cordova West

The Herzog Self-Feed Jointer

means

Increased Production **Simplicity of Operation**
Small Floor Space **Safety to Employees**

Does four times the work of the Hand Jointer

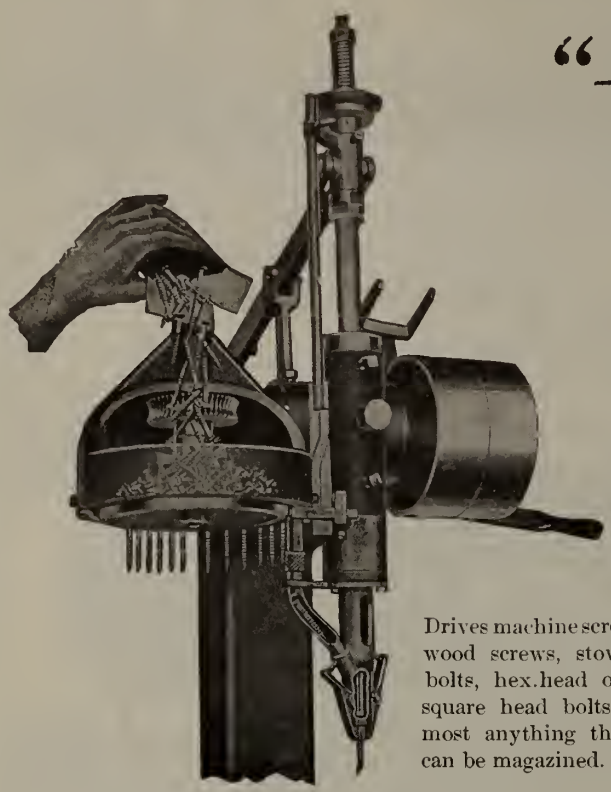


Our No. 34 Herzog Jointer, illustrated above, is one of the most efficient machines on the market to-day. It is appreciated by the manufacturer and employees alike, because, while it will produce from three to five times as much work as the hand jointer, it does not require skilled operators, but eliminates the danger so common to other makes. It can be operated by two boys. It will handle stock varying in width from 1 inch to the full width of the jointer, will feed fast or slow, takes only one-fourth the floor space of hand jointers, and requires only one-fifth of the sharpening of the knives. It is fitted with power feed raising and lowering attachment, with cylinder double belted and driven from both ends.

If interested in reducing your costs, write us

Jackson, Cochrane & Company

KITCHENER - CANADA



Drives machine screws wood screws, stove bolts, hex.head or square head bolts, or most anything that can be magazined.

"—and the machine does the rest"

This unique piece of mechanism is revolutionizing the operation wherever installed. It is an important part of almost every up-to-date woodworking plant on the continent.

The
Reynolds Machine Co
Department C.
Massillon, Ohio, U. S. A.

BOX-MAKING UP-TO-DATE

Box-making is an important, though only one, use to which Robertson's "Recessed Head" screw is best suited.

The advantage of this screw—greater rapidity in driving, less chance of slipping, elimination of splitting, etc., are well known to the operator in the photograph. In this instance he is shown running a Reynolds Automatic screw-driving machine. This combination, he declares, has resulted in a marked increase in production.

Drivers and Bits to fit and style power machine, or ratchet driver free with first order.

Get our catalogue explaining full details.

P. L. ROBERTSON
MFG. CO. LTD.
MILTON - - - ONTARIO

No. 830
Open Back Nailing Machine

Yates

NAILING MACHINES

are real helpers in any plant. Why? They will drive nails five to ten times as fast as a man, and drive them absolutely straight.

They are real Time and Labor Savers. Our descriptive circular explains fully the possibilities of a Nailing Machine. Write for one.

P. B. Yates Machine Co. Ltd.
Hamilton Canada

H. W. PETRIE LIMITED

CANADA'S DEPENDABLE
MACHINERY and SUPPLY HOUSE

H. W. PETRIE LIMITED TORONTO

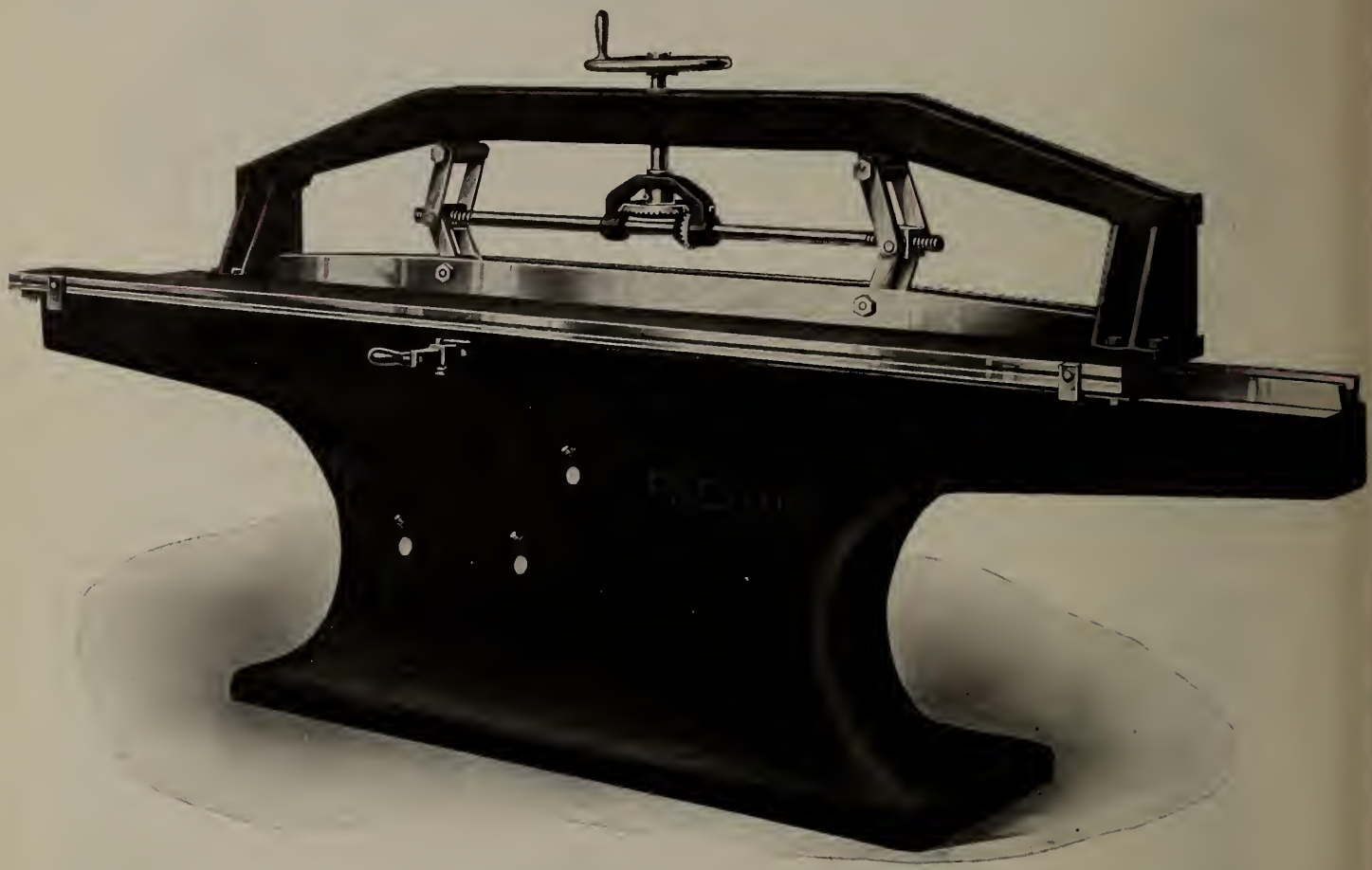
NEW AND USED
WOODWORKING MACHINERY

Let us Quote on Your Requirements

131-147 FRONT STREET WEST TORONTO

HAMILTON OFFICE: 4 KING STREET WEST

The Preston Veneer Jointer has many exclusive features



Designed for the purpose of making commercially perfect face joints, butt or crosswise, as well as lengthwise of the grain on the highest figured Circassian Walnut or Crotch Mahogany Veneer.

As rigidity is an essential feature of this type of machine, special care was taken in its construction. The frame, which is of cored section, is cast in one solid piece.

It is the only machine that will effectively joint buckled veneer.

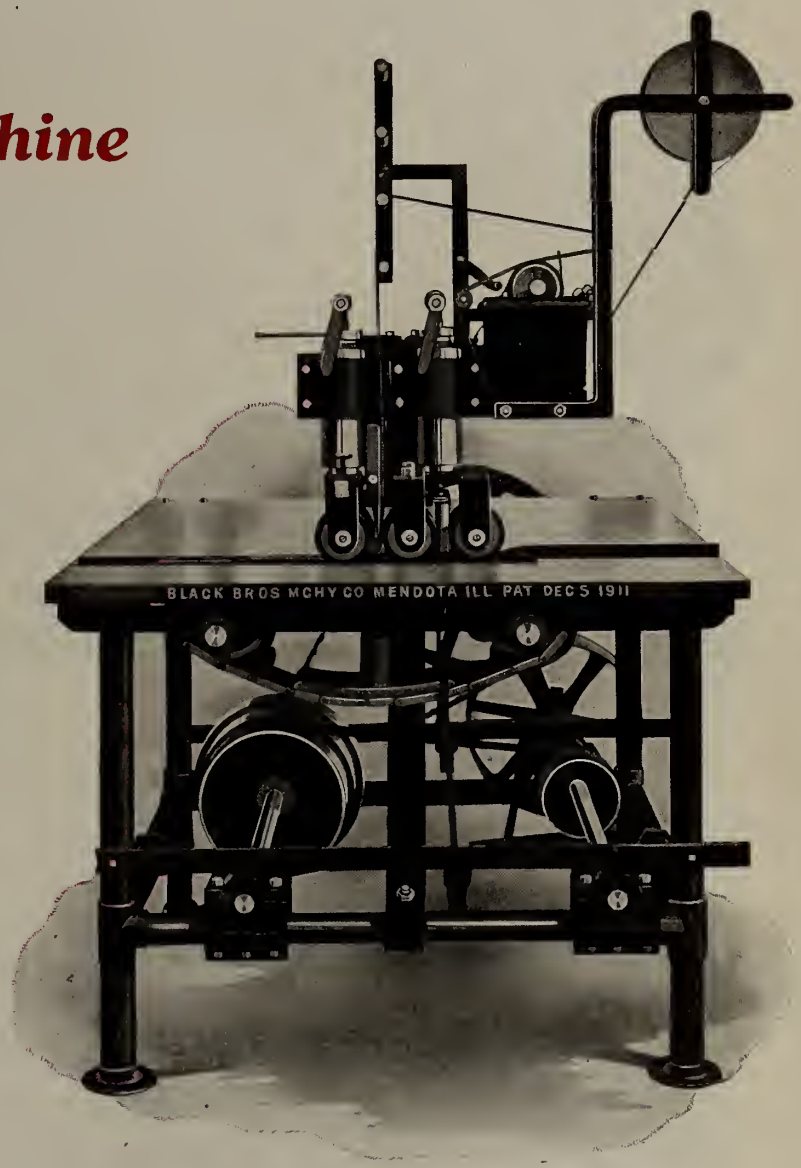
Write for Catalogue

The Preston Woodworking

We are the Sole Manufacturers and Agents in Canada of the Eaglesfield Patented Beltless Swing Saw

This Machine is just what you Need in Your Veneer Room

The "Black Bros." Veneer Taping Machine



Any machine that will increase the output of your plant without adding to the overhead is surely worth your consideration. The Veneer Taping Machine here illustrated does this to an unusual degree, hence its popularity throughout the length and breadth of the woodworking industry. So sure are we that it will win your approval that we will instal it on trial. You can be the judge.

In operation it will handle with equal speed veneer of any thickness, using the ordinary gum tape or plain tape and applying its own gum or glue as it is used.

Built in two sizes—24 in. and 36 in.

Machinery Company, Ltd.

PRESTON, ONTARIO

If It's Machinery—Write "WILLIAMS"

EXCEPTIONAL BARGAINS

appearing in our regular Monthly Woodworking Machinery List, are as follows:—

51252—7½ ft. Taylor Clamp Carrier, practically new, 40 sections, 160 clamps, opening 37 in.
42325—Baker Bros. Dowel Machine, 2½ in., used.
51394—C.M.C. Dowel Machine, with 1 in., 1⅛ in. and 1¼ in. heads, used.
51393—Nash Broom Handle Sander, used.
50042—Reynolds Screwdriver, for size 10, 11 and 12 screws, used.
50659—No. 10 Morgan, open back, Nailer, with clinching device, used.
50837—No. 7 McGregor-Gourlay 54 in. Band Resaw, cuts 6 in. on one side, and 3½ in. on the other, resaws 20 in. wide, saw 5 in., used.
51177—Fay and Egan 60 in. Band Resaw, with 6 in. saw, cuts to centre of 10 in., resaws 21 in. wide, used.
30904—30 in. Cowan 3-drum Sander, used.
48850—42 in. Berlin Invincible, 3-drum Sander, used.
50985—No. 4½, 30 in. American Sectional Roll Cabinet Planer, used.
51248—Fay and Egan No. 112 Lightning Flooring Planer, used.
51181—Yates 2-G Straight Edge Ripper, 10 in. saw, with revolving bed, used.
51302—No. 638 C.M.C. Lightning Cut-off Saw, used.
38383—Berlin 10 in. 4-side Moulder, with revolving bed, used.
50577—Refitted No. 155 42 in. Jackson-Cochrane Band, Rip and Edging Saw, with 4 in. blade.
Q-1—Practically new Berlin 30 in., 3-drum Sander, variable feed.

Our Monthly List is the largest and most comprehensive list of first-class Woodworking Machinery issued.

THE PRICES ARE RIGHT

The A. R. Williams Machinery Co. Limited

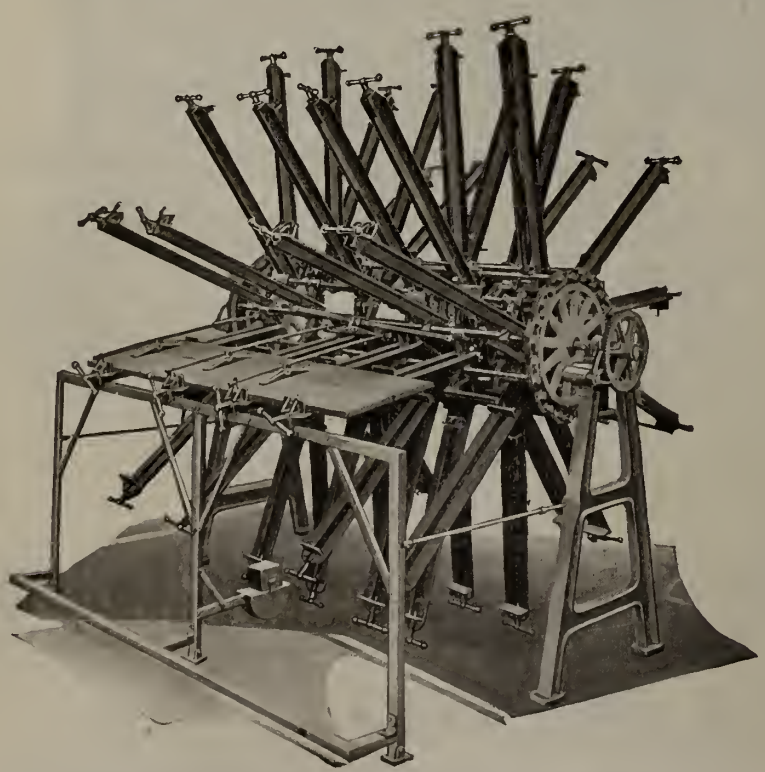
64 FRONT ST. WEST - TORONTO

Phone Woodworking Machinery Dept., Adelaide 20

Full lines of Iron and Wood-Working Machinery, Boilers, Engines and Contractors' Machinery, Electric Motors, Saws, Shingle and Lath Mill Machinery, etc.

HALIFAX, N.S. ST. JOHN, N.B. MONTREAL, P.Q. TORONTO, ONT.
VANCOUVER, B.C. WINNIPEG, MAN.

Speed + Perfect Joints = Low Costs



The Taylor TRADE MARK

CLAMP CARRIER

for

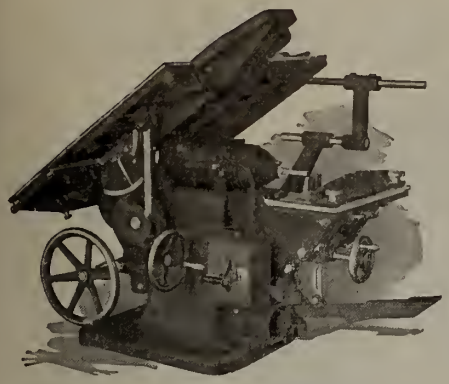
Small Jobs in the Big Plant
All Jobs in the Little Plant

1. Natural standing position of operator.
2. No Juggling of heavy clamps.
3. No bending or walking.
4. No pile to overturn to get work glued first—simply move clamp one section.
5. Less space than equal number of clamps with work in, piled on the floor.

Any size to suit your work. 8 and 12-section wheel type. 16, 20, 30 and 40-section chain type. 4, 5 or 6 clamps per section for stock up to 42-in. wide.

Representatives:
A. R. Williams Machinery Co., Toronto, Canada

James L. Taylor Mfg. Company
Poughkeepsie, N.Y., U.S.A.



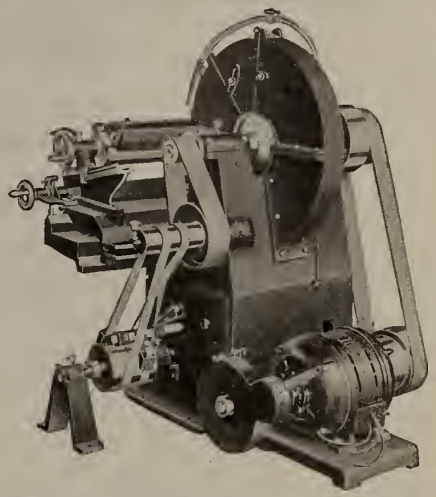
"Oliver" No. 80 Variety Saw Bench Direct Motor Drive. Ballbearings.

"OLIVER"
OLIVER MACHINERY CO.

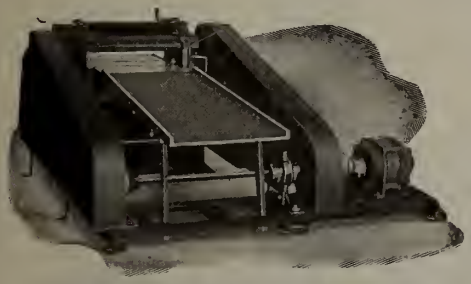
"Oliver Quality"

Woodworking Machinery

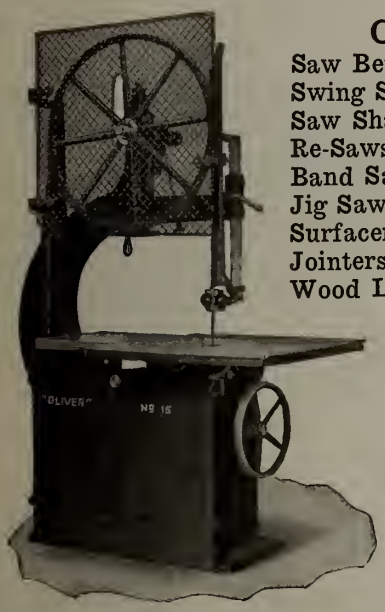
It takes a 304-page Catalog to describe the "Oliver" High-grade Furniture-making and other Woodworking Machinery. May we send you a copy? Let us know your wants, we may have other literature of interest to you.



We build a large line of straight and cupwheel knife grinders, from the smallest to the largest sizes.

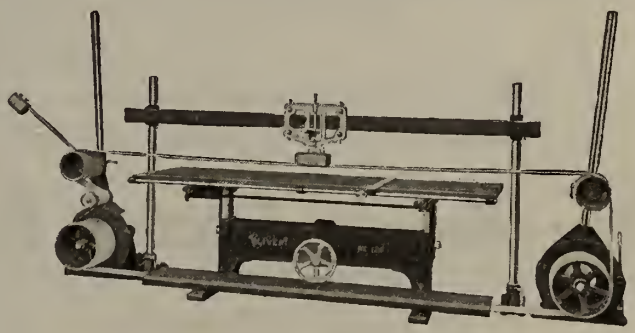


"Oliver" Pony Planer. This is also built with direct motor drive. Line includes fast feed double Surfacers.



OLIVER TOOLS

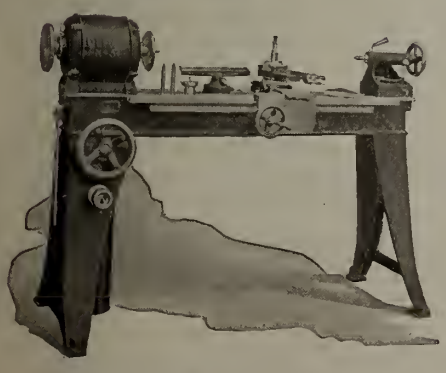
Saw Benches	Sanders
Swing Saws	Boring
Saw Sharpeners	Machines
Re-Saws	Mortisers
Band Saws	Tenoners
Jig Saws	Shapers
Surfacers	Trimmers
Jointers	Grinders
Wood Lathes	Vises
Glue Heaters	



"Oliver" Belt Sander. Also build Variety, disk, spindle, and drum sanders. Ask for particulars.

"Oliver" Woodworking Machinery are built of strictly High-grade Materials, from most Improved Design and types by Real Mechanics.

We solicit the opportunity of convincing you if you are interested.

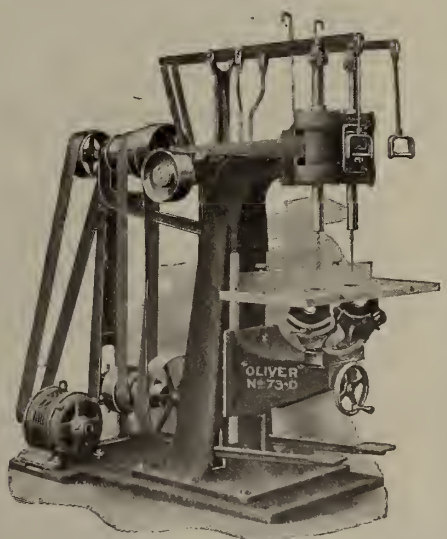


"Oliver" No. 51 Motor Head Speed Lathe (Just one of a big variety).

Oliver Machinery Co.

Grand Rapids, Mich., U.S.A.

"Oliver" Oilstone Grinder.



"Oliver" Boring Machines are built one or two spindle, also horizontal.

The Shimer Round Safety Cylinder with High Speed Knives

A Round Safety Cylinder that will Appeal to the Buyer and the User for three Reasons:

The first is our adjusting nut for setting the knives. It is the only cylinder with properly located adjusting nuts for setting the knives, which, with our way, can be set to 1-1000 of an inch.

The second is our way of holding the knife without tapping into the head.

The third is the correct angle of cut for the knives.

Made for Any of the Different Makers' Machines and in Any Length Cylinder.

WRITE FOR PRICES

SHIMER CUTTER HEAD CO. OF CANADA, LIMITED

Manufacturers of Cutter Heads, Safety Cylinders and Grinders

GALT, ONTARIO

The Mereen-Johnson Resaw

has many features of advantage which place it far ahead of anything in the Resaw field.

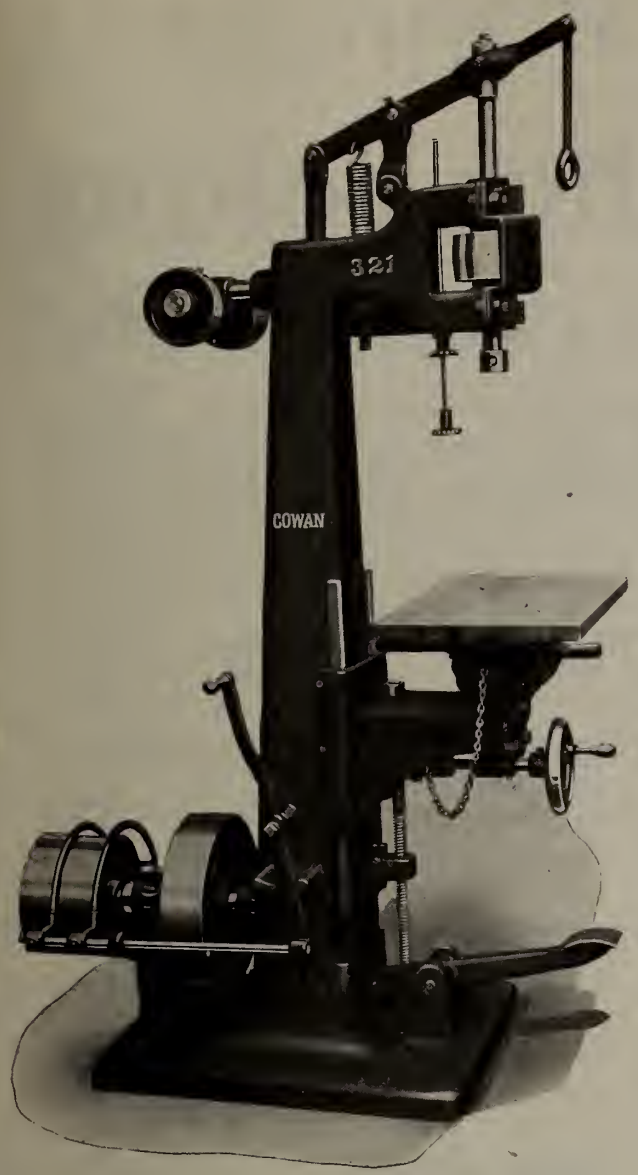
No pulleys—no belts—no frictions.

The sprocket and chain arrangement for changing speeds is only one of the many improvements on this machine.

Write for circular.

Mereen-Johnson Machine Co.

Minneapolis Minnesota, U.S.A.



Borer 321

Tilting and Plain Table.
Simple to Adjust. Easy to Operate.
Strong, Steady and Accurate.
Spindle 12 in. from post; travels 6 in.
Table 14 in. x 28 in.
Adjusts 15 in. Vertically.

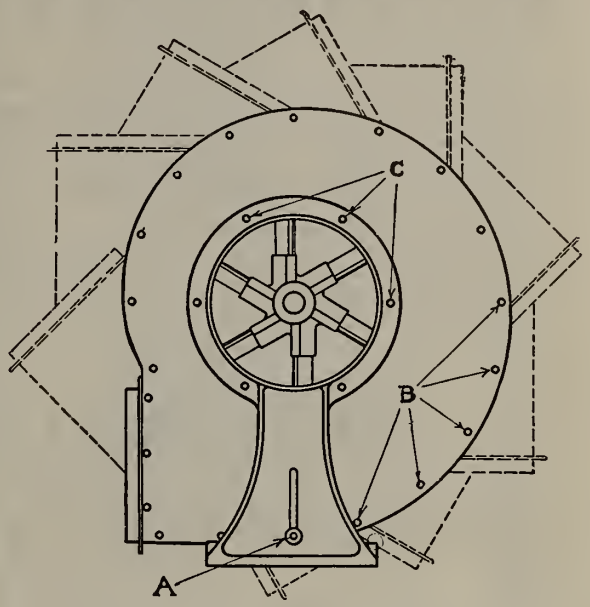
Prices of this or other WOODWORKING MACHINERY on application.

Cowan & Company of Galt

Limited

Galt Ontario Canada

Canadian Mill Exhausters



One of the features of the Canadian Planing Mill Exhauster is the reversible housing. It is easily adjustable to either hand and to any discharge.

By this arrangement one fan may be used to meet all requirements, thus eliminating crossed belts and sharp angles.

Let our engineering department help you plan your refuse exhauster system.

Write for catalogue 400-13.

Canadian Blower & Forge Co.

KITCHENER, ONT.

FEWER PULLEY HOLIDAYS

— WITH —

Krome Leather Belting

The long, tough fibre of Vulcanite Krome Leather Belting makes it so strong and capable that it will bear almost double the breaking load of ordinary leather, consequently you have fewer breakdowns.

Krome Leather Belting is friction-proof—it is oil-proof—it is waterproof.

Krome Leather Belting is working successfully in a cold brine drip—it is working successfully in hot water. **The alternate wetting and drying does not injure it.**

Let us quote you on Krome Leather Belting in Flat, Twist or Round.

Ask for a Sample and Test its Strength.

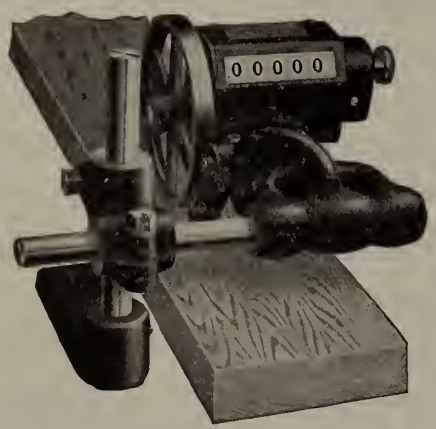
MECHANICAL LEATHERS LIMITED

126 Garden Avenue, Toronto

Canadian Representatives of the Chicago Rawhide Manufacturing Company

If made of hide for mechanical purposes we have it

Almost Human— In a Measure



The Productimeter

Men will sometimes guess when making estimates—or when measuring lumber.

This little automatic machine, easily applied to moulders, matchers, stickers, self-feed rip saws, etc., does not guess, lose count or "lay down" on the job. It measures every foot of lumber that passes, and gives you instant, accurate, reliable figures to base your estimates and costs, without guessing. Works honestly—doesn't need watching.

Send for catalog. Or tell us what machine you want to check up on and we'll send you the Productimeter on 30 days' trial.

Durant Manufacturing Co.

615 Buffum St. Milwaukee, Wis.

(1230)

The Berry Combination Band and Circular Automatic Saw Sharpener

Belt or Motor Driven. Capacity: Bands, 3-16" to 4", Circulars 4" to 32". Simple, Universal, Automatic in Action.

It is the only *combination* grinder that is *automatic*

It is the only grinder that will grind a saw absolutely round after three months continuous use—without readjustment or rebabbiting. It will take an unevenly spaced, hand-filed saw and make it perfectly round and even spaced. No other machine will do this.

For All Shops Using Circular or Band Saws

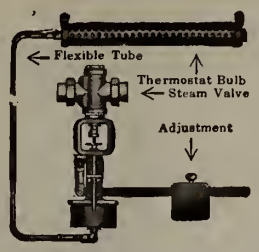
The Berry Tooth is far superior to the ordinary peg tooth. All teeth are alike, evenly spaced—ground right from the center. A saw ground with this machine does twice the work in half the time.

Write for Booklet to-day.

O. V. HOOKER & SON

St. Johnsbury Vermont

Man's Mind Makes Mistakes



The Powers Regulator No. 15
Specially adapted for control of air temperatures in leather dryers, ovens and kilns. Write for Bulletin No. 138. There are other Powers Regulators for other places—acid baths, hot water tanks, etc.

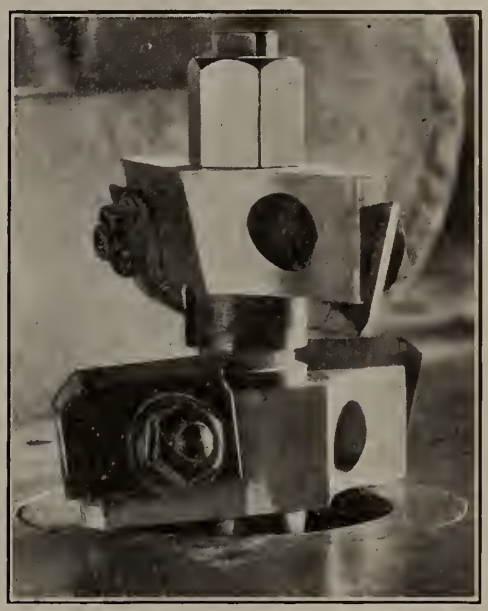
Wherever there is need for maintaining a definite uniform temperature —as in drying rooms, ovens, vats, kilns, etc.—men may forget—but machines cannot. You depend on your men to watch the temperatures, but they are only human and, as careful as they try to be, they have sometimes allowed valuable hides to be spoiled.

The Powers Automatic Heat Regulator

Built scientifically in accordance with known physical laws. Self contained; entirely automatic; can be adjusted to maintain any desired degree of heat; stays on the job every minute and does not **forget to** "turn 'er on" or off when the temperature even **approaches** the danger point. Prevents loss and damage and worry. Set the Powers Regulator and you can **depend** on results.

The Canadian Powers Regulator Co.
Specialists in Automatic Heat Control
82 Chestnut St. Toronto, Ont.
(1263A)

Something New-- Panel Raiser



These heads to be used on Shaper or vertical spindle. Heads made of aluminum. Do perfect work to raise 125 to 150 doors per day. High speed steel knives adjustable collar for fitting groove.

Rule for Quick Work

This rule assures accurate and quick work and allows the attendant to treble his work. This means one machine in place of three. Can be adjusted to any machine.

See article in reading columns of last issue.

Arbuthnot Lumber, Sash and Door Co.
Vancouver, B.C.

PROTECT YOURSELF

Against lowering prices by WORKING YOUR WASTE into turned work of various kinds.

The 22 inch No. 2 OBER LATHE shown above will turn a large variety of work that can be made from waste and other low grade timber.

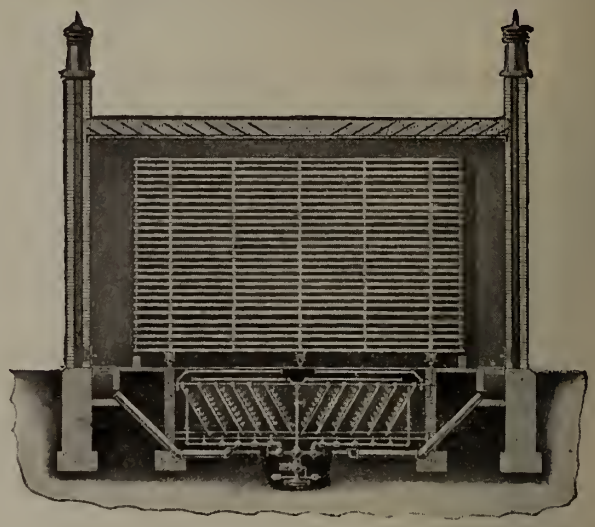
We also build other machines for doing other turned work.

Write for free catalogue No. 31

THE OBER MFG. CO.

CHAGRIN FALLS. O., U.S.A.

Thermo-Myst System



BEFORE YOU BUILD

DRY KILNS

Investigate the merits of our system. Catalog and layouts mailed on request.

Curtis-Hosey Dryer Co. of Canada

177-179 Duke Street, MONTREAL, P.Q

THIS IS THE NAME

of the Machinery for the Rapid Production of

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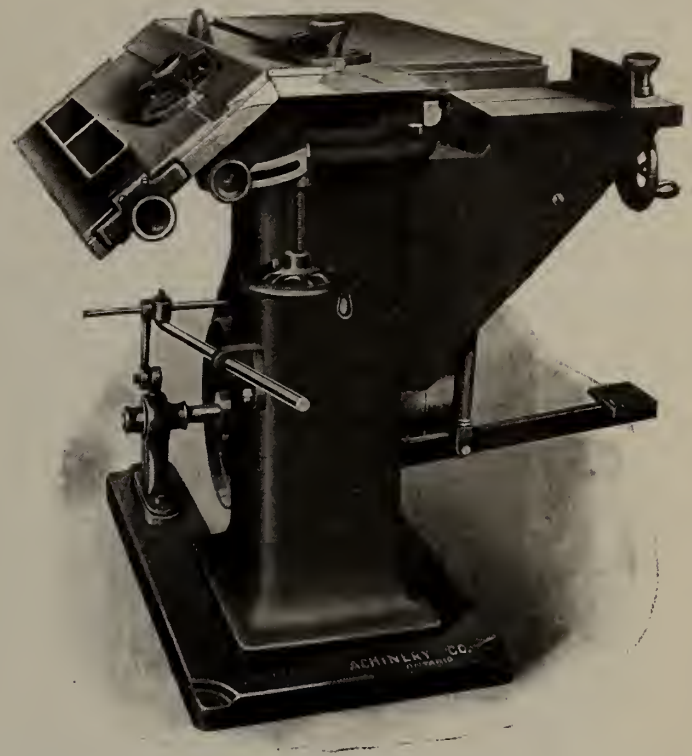

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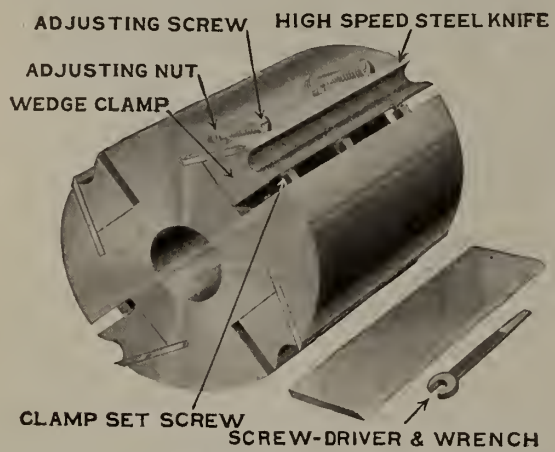

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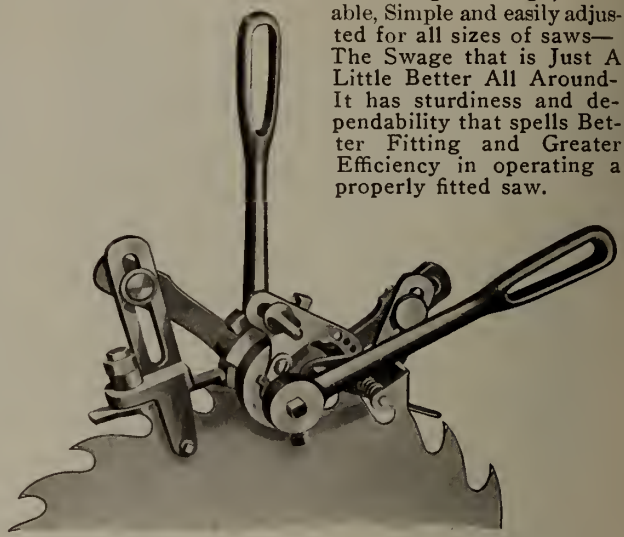

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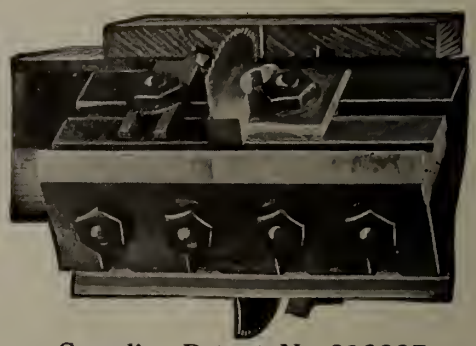

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Process and Product Patents covering PerkinsGlue were granted July 2nd and March 19th, 1912, and have been held valid and infringed by the United States Circuit Court of Appeals. Patents have also been granted in Canada, Great Britain, France, Belgium, Italy and other foreign countries.

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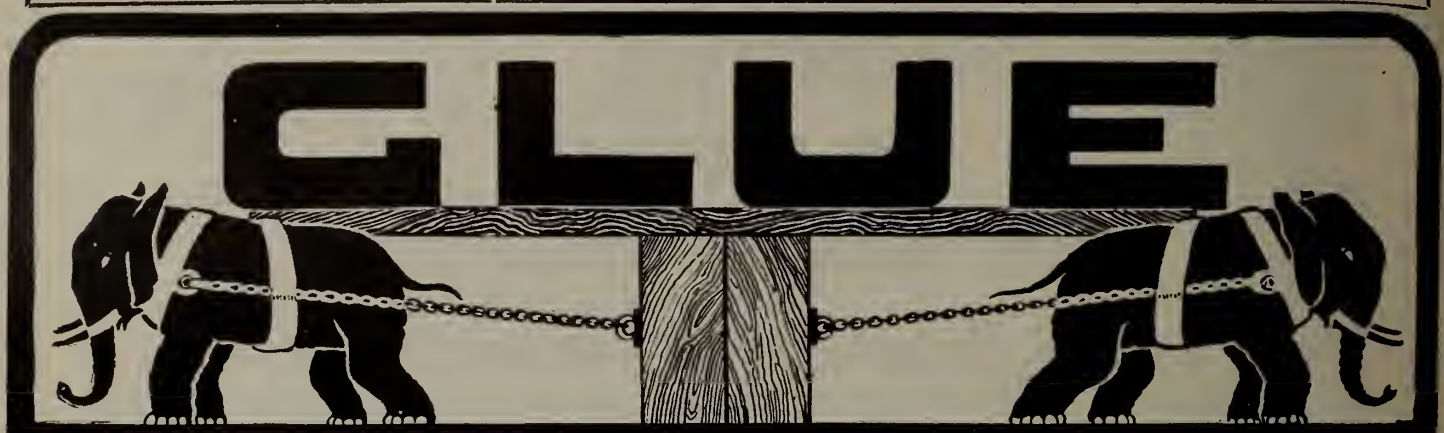

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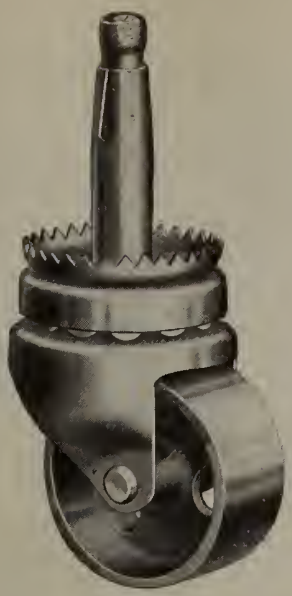

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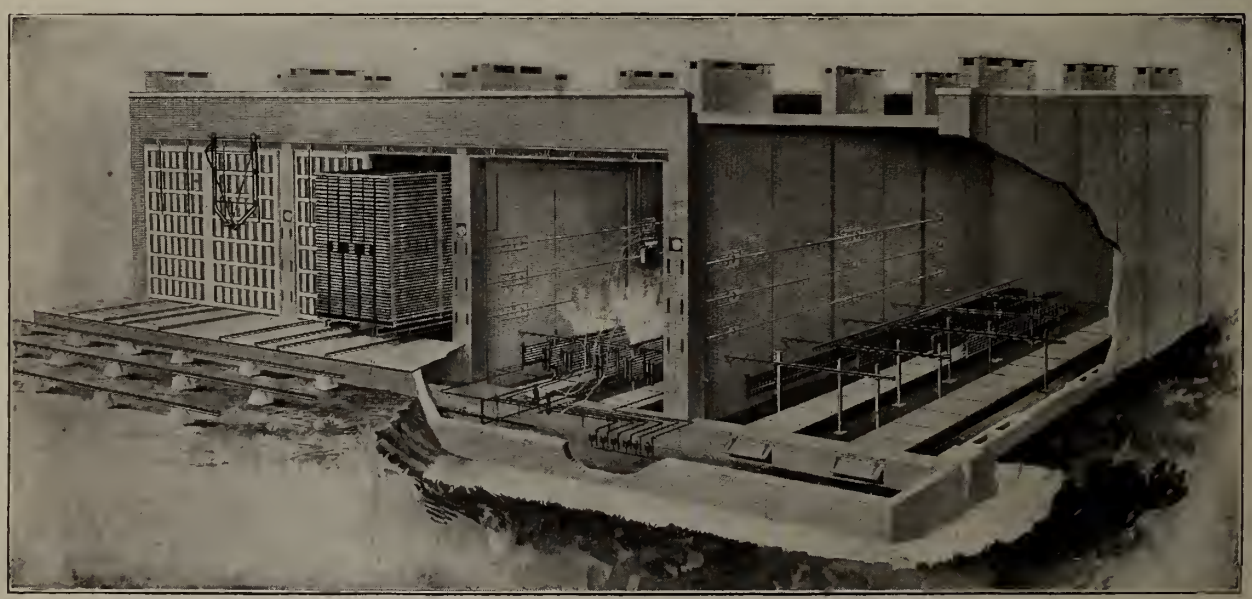

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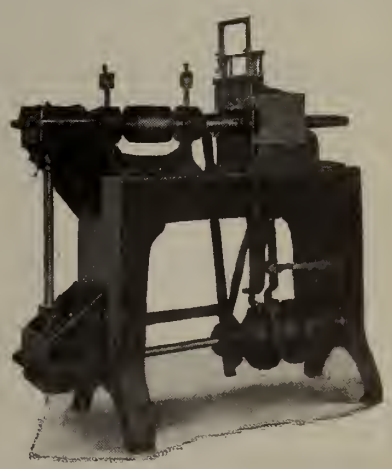

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Office: 909 Duke Street
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Holloway, Randell & Co., Ltd.,
Halifax, N.S.

Gentlemen,—

Your favor July 30th to hand. We received tin of glue and have found it to give the best satisfaction we have had yet.

We are now glueing up a large friction and will let you know later how everything turns out.

Yours very truly,
THE UNION FOUNDRY & MACHINE WORKS, Limited,
Per M. E.

SAINT JOHN IRON WORKS (Limited)
Office and Works: Vulcan Street
Marine and Mill Machinery, Boilers, Tanks, etc.,
Iron and Brass Castings.
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Messrs. Holloway, Randell & Company, Limited,
Halifax, N.S.

Gentlemen,—

Replying to yours of August 1st, we beg to report that we have tested the Lactocol Glue and find it stands up to all tests very satisfactorily. It seems to us that this is the best thing in this line that we have yet had.

Yours very truly,
SAINT JOHN IRON WORKS, LIMITED
HPJ/VMF H. P. Jenkins, Manager.

D. G. KIRK WOODWORKING AND CONTRACTING CO.
ANTIGONISH, N.S., Aug. 3, 1921.

Holloway, Randell & Co., Ltd.,
Halifax, N.S.

Dear Sirs,—

Your favor of July 30th to hand, asking if we found Lactocol Cold Water Glue satisfactory. In reply, we may say that it is perfectly satisfactory. We soaked a glued piece of Douglas Fir for forty-eight hours and we were unable to take it apart.

Yours very truly,
D. G. KIRK WOODWORKING CO. RHD/MD

CHAPPELLS LIMITED
Wood Workers and Builders
SYDNEY, N.S., Aug. 1, 1921.

Messrs. Holloway, Randell & Co., Ltd.,
Halifax, N.S.

Dear Sirs,—

Replying to your communication of July 29th, would say that we have tested out Lactocol Cold Water Glue and up to the present are entirely satisfied with results in connection with its adhesive qualities. Another feature which Lactocol has is its price, which we find compares favorably with the ordinary glue on the market; the initial cost is a little more, but on account of its economic quality, we find it is cheaper in the long run.

Yours truly,
CHAPPELLS LIMITED
Per M. R. Chappell.
MRC/M

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Iron Founders and General Machinists
Pattern Work a Specialty
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Gentlemen,—

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We, after making these tests, highly recommend this glue for any kind of woodwork.

Yours very truly,
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Per H. B. Douglass.
HBD/AJD

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200,000′	8/4	Sel. & Fas.
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The Pedwell Hardwood Lumber Company

FOOT SPADINA AVE. - TORONTO

Stock on Hand in Kitchener for Immediate Shipment

3,000	ft.	4/4 x 10 in. and up Qt'd White Oak Fas.
12,000	"	4/4 x 6 in. and up Qt'd White Oak Fas.
15,000	"	4/4 x 6 in. and up Qt'd White Oak No. 1 com.
2,680	"	3/4 x 13/17 Sap Gum Fas.
4,700	"	3/4 x 3/12 Sap Gum No. 1 Com.
400	"	5/4 x 6 in. Plain red Gum Fas.
4,000	"	4/4 x 6 in. up Sap Gum No. 1 Com.
5,000	"	8/4 x 6 in. up Qt'd red Gum C. & B.
8,000	"	5/4 x 6 in. Plain White Oak Fas. ... ...
2,000	"	6/4 x 4 in. Plain White Oak No. 1 Com.
15,000	"	6/4 x 6 in. Plain red Oak Fas.
10,000	"	8/4 x 6 in. Plain red Oak Fas.
25,000	"	8/4 x 4 in. Plain red Oak No. 1 Com.
12,000	"	4/4 x 3 in. Tenn. Red Cedar No. 1 C. & B.
25,000	"	8/4 Sound Wormy Chestnut
2,000	"	5/4 Sount Wormy Chestnut
32,000	"	6/4 Sound Wormy Chestnut
5,000	"	4/4 Chestnut No. 1 C. & B.
10,000	"	5/4 Chestnut No. 1 C. & B.
10,000	"	6/4 Chestnut No. 1 C. & B.
43,000	"	4/4 Soft Elm No. 3 C. & B.
1,000	"	4/4 Soft Elm No. 3 Common
12,000	"	8/4 Soft Elm No. 2 C. & B.
15,000	"	12/4 Soft Elm No. 2 C. & B.
5,285	"	12/4 Oak No. 2 Common & Better
6,000	"	12/4 Oak No. 2 and 3 Common
12,000	"	4/4 Hard and soft Maple No. 3 C. & B.

PERCY E. HEENEY

Office: 298 Breithaupt St., KITCHENER, ONT.

J. R. EATON & SONS, LIMITED

MANUFACTURERS OF HIGH GRADE WOOD PRODUCTS

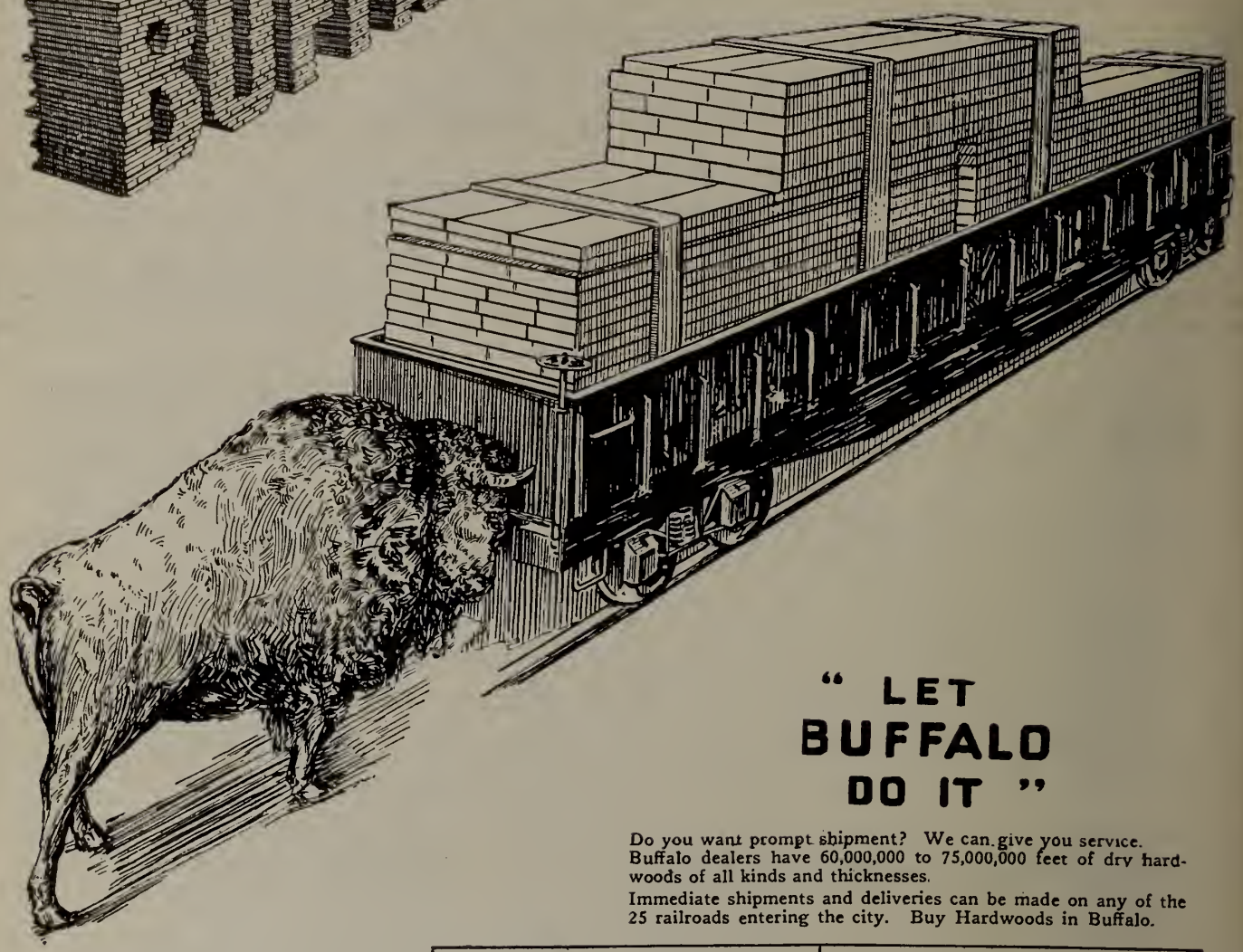
Wood Turnings, Hardwood Dowels, Turned Table Legs, Kitchen Tables, Kitchen Cabinets, Oak Extension Tables, Oak Library Tables, "Empire Brand" Hardwood Flooring in Maple, Birch, and Plain or Quarter Cut Oak, Solid Pine and Veneered Hardwood Doors.

A Large Factory equipped with up-to-date machinery is at your service to furnish "WHAT YOU WANT"— WHEN YOU WANT IT."

YOUR ENQUIRIES SOLICITED

Orillia Ontario Canada

BUFFALO FOR HARDWOODS



"LET BUFFALO DO IT"

Do you want prompt shipment? We can give you service. Buffalo dealers have 60,000,000 to 75,000,000 feet of dry hardwoods of all kinds and thicknesses.

Immediate shipments and deliveries can be made on any of the 25 railroads entering the city. Buy Hardwoods in Buffalo.

FRANK T. SULLIVAN
Specialties:
CHERRY, WALNUT and PACIFIC COAST WOODS
Main Office: 600 Ellicott Square.
Yard: 2598 Delaware Avenue.

T. Sullivan & Company
NORTHERN GREY ELM
and
BROWN ASH
Niagara Street Corner Arthur

Atlantic Lumber Company
HARDWOODS
WEST VIRGINIA SOFT RED AND WHITE OAK
Our Specialty: West Virginia and Pennsylvania Cherry
1055 Seneca Street

Miller. Sturm & Miller
1142 SENECA STREET
Hardwoods of All Kinds

Yeager Lumber Co., Inc.
SPECIALTIES
Oak, Poplar, Ash, Maple
932 Elk Street

STANDARD HARDWOOD LUMBER COMPANY
Hardwoods
Prompt Shipment { From Buffalo Yards or From Mill direct to you
8 MILLION FEET DRY STOCK ON HAND
1333 Clinton St.

G. Elias & Bro., Inc.
Established 1881
All Kinds of Hardwood Lumber
And in addition we carry a full line of White Pine, Yellow Pine, Spruce, Hemlock and Fir Timber, Lumber, Millwork and Boxes—Maple and Oak Flooring
Careful attention to mixed car orders.

Buffalo Hardwood Lumber Co.
J. B. WALL, Pres. M. M. WALL, Treas.
T. H. WALL, V.-Pres.
940 SENECA ST.
We Specialize in White Ash, Oak & Maple
We also handle a complete stock of Quartered Oak, Maple, Poplar, Red Cedar, etc.

Hugh McLean Lumber Co.
Hardwoods of All Kinds
Our Specialties—QUARTERED WHITE OAK, SAP AND RED GUM
940 ELK STREET

Taylor & Crate
Hardwoods of All Kinds
A stock of 18,000,000 to 20,000,000 feet of hardwoods carried at all times at our two big Buffalo Yards
Established 50 Years
RAIL OR CARGO SHIPMENTS

Blakeslee, Perrin & Darling
A Complete Stock of Seasoned Hardwoods
including Ash, Basswood, Birch, Cherry, Chestnut, Cypress, Elm, Gum, Hickory, Maple, Plain and Quartered Oak, Poplar and Walnut.
1100 Seneca Street

To —
Furniture,
Desk and Table
Manufacturers

GORHAM PLYWOOD

is well and favorably known in Canada as well as the States and its use in the form of Tops, Drawer Fronts, End Panels etc., in your product, will be a long step in securing the confidence of your customers which will result in orders and re-orders.

Our trademark is stamped on the back of every Top and Panel we make. Our guarantee that it is right and will stay right.

Mercerau-Hawkins Tie Company

Huntington - W. Va.

Manufacturers and Wholesale Dealers

West Virginia and Southern

HARDWOODS

We specialize in

Oak Tie Siding
White and Red Oak
Yellow Poplar
Basswood
Chestnut and
Gum Lumber.

Canadian Sales in Charge of

C. W. PETERS

Vice President and Manager of Lumber Dept.

Peytona Lumber Co. Inc.

HUNTINGTON, W. VA.

BAND MILLS OMAR, CHRISTIAN LOGAN COUNTY, W. VA.

Band Sawed West Virginia Hardwoods

WHITE OAK	BASSWOOD
RED OAK	MAPLE
CHESTNUT	BEECH
POPLAR	HICKORY

Our own facilities for Surfacing, Resawing and Kiln Drying

William S. Whiting Company

JOHNSON CITY, TENNESSEE

1 Band Mill — *5 Circular Mills*

Hardwood Lumber

Oak	Basswood
Maple	Buckeye
Chestnut	Poplar
Ash	Birch

Rotary-Cut Soft Yellow Poplar Veneers
Quarter-Sawn White Oak Flitches
Sliced and Sawn Quartered White Oak Veneers
Oak and Maple Flooring
Dowel Pins and Dowel Rods
Glued-Up Chestnut Cores and Dimension

5-16" Oak Parquetry Flooring Strips and Squares carried in stock at our warehouses:
138 44th St., Brooklyn, N.Y., and at Elizabethton, Tenn.

Arkla Lumber & Mfg. Company

Main Office: - St. Louis, Mo.

Manufacturers and Wholesalers

Ash—Plain and Qtd. White and Red Oak Poplar, Cypress, Gum

In addition to stocks at Mill, we carry a well assorted dry stock of all items on our St. Louis yard available for immediate shipment. Write or wire us (our expense) for quotations.

F. HUNTINGTON SMITH

Canadian Representative

Lumber
Walnut, Mahogany Plain and Quartered Oak, Ash, Cherry

Veneers
Walnut and Mahogany

WE specialize in AMERICAN BLACK WALNUT and can furnish straight cars from 3/8 to 4 inches in thickness. Also can load mixed cars WALNUT and MAHOGANY LUMBER and VENEERS, PLAIN and QUARTERED RED and WHITE OAK, ASH and CHERRY.

The Kosse, Shoe and Schleyer Co.

Eastern Branch:
BALTIMORE, Md.

Main Office and Band Mill:
CINCINNATI, Ohio

Miller Lumber Company, Marianna, Arkansas, U. S. A.

Manufacturers of Southern Hardwoods

QUARTERED WHITE OAK

		Quantity
4/4	FAS	15,000
4/4	FAS	50,000
5/4	FAS	25,000
6/4	FAS	2,000
6/4	FAS	15,000
8/4	FAS	20,000
4/4	No. 1 Com.	400,000
5/4	No. 1 Com.	12,000
6/4	No. 1 Com.	4,000
6/4	No. 1 Com.	5,000
8/4	No. 1 and 2 Com.	6,000
4/4	No. 2 Com.	100,000

PLAIN WHITE OAK

4/4	FAS	18,000
4/4	FAS	40,000
5/4	FAS	10,500
8/4	FAS	5,000
4/4	No. 1 Com.	300,000
4/4	No. 1 Com.	200,000
5/4	No. 1 Com.	30,000
6/4	No. 1 Com.	40,000
8/4	No. 1 Com.	40,000
4/4	No. 2 Com.	250,000
4/4	No. 2 Com.	100,000
5/4	No. 2 Com.	8,500
6/4	No. 2 Com.	10,500
8/4	No. 2 Com.	15,000

QUARTERED RED OAK

4/4	No. 1 and 2 Com.	35,000
4/4	No. 1 and 2 Com.	50,000

PLAIN RED OAK

4/4	FAS	60,000
5/4	FAS	30,000
8/4	FAS	18,000
4/4	No. 1 Com.	500,000
4/4	No. 1 Com.	200,000
5/4	No. 1 Com.	33,000
6/4	No. 1 Com.	11,000
8/4	No. 1 Com.	32,000
4/4	No. 2 Com.	600,000
4/4	Sound Wormy	100,000
4/4	No. 3 Com.	500,000
5/4	No. 3 Com.	32,000
6/4	No. 3 Com.	15,000

MISCELLANEOUS OAK

4/4	3-5½" clr. Pl. Wh.O. Strips...	5,000
4/4	3-5½" clr. Pl. R.O. Strips.....	5,000
4/4	2-5½" clr. Qt. W.O. Strips SND	15,000
5/4	Pl. R.O. Step Plank, 11" & up.	11,000
8/4	R&W O. Bridge Plank	75,000
10/4	R&W O. Bridge Plank	15,000
12/4	R&W O. Bridge Plank	15,000

QUARTERED RED GUM

5/4	No. 1 C&Btr.	15,000
6/4	No. 1 C&Btr.	19,000
8/4	No. 1 C&Btr.	22,000
5/4	No. 1 Com.	13,000

PLAIN RED GUM

4/4	FAS	58,000
6/4	FAS	8,700
6/4	No. 1 Com.	3,700

SAP GUM

4/4	9-12" Bx. Bds.	63,000
4/4	9-12" Bx. Bds.	50,000
4/4	13-17" Bx. Bds.	56,000
4/4	18" & up Pan & W No. 1.....	4,200
4/4	6-12" FAS	50,000
4/4	13-17" FAS	40,000
4/4	13-17" FAS	50,000
5/4	No. 1 C. & Btr.	134,000
6/4	No. 1 C. & Btr.	83,000
4/4	No. 1 Com. Sap	200,000
4/4	No. 1 Com. Sap	200,000
5/4	No. 1 Com.	9,000
6/4	No. 1 Com.	5,000

TUPELO

4/4	6-12" FAS	21,000
4/4	13-17" FAS	4,600
4/4	9-12" Bx. Bds.	6,800
4/4	13-17" Bx. Bds.	2,300
4/4	No. 1 Com.	45,000

ASH

5/4	No. 1 C. & Btr.	1,300
8/4	No. 1 C. & Btr.	20,000
10/4	No. 1 C. & Btr.	15,000
12/4	No. 1 C. & Btr.	15,000

COTTONWOOD

4/4	FAS 6-12"	110,000
4/4	FAS 13-17"	27,000
4/4	18" & up Pan. & W. No. 1...	9,900
4/4	9-12" Bx. Bds.	32,000
4/4	13-17" Bx. Bds.	20,000
4/4	No. 1 Com.	100,000
4/4	No. 1 Com.	50,000
4/4	No. 2 Com.	100,000
4/4	No. 2 Com.	50,000

ELM

4/4	No. 1 C. & Btr.	69,000
6/4	No. 1 C. & Btr.	42,000
8/4	No. 1 C. & Btr.	15,000
10/4	No. 1 C. & Btr.	36,000
12/4	No. 1 C. & Btr.	32,000

MAPLE

4/4	Log Run	74,000
5/4	Log Run	62,000
6/4	Log Run	12,500
8/4	Log Run	100,000
8/4	Log Run	100,000

SYCAMORE

5/8"	No. 2 C. & B. Qtd.	30,000
4/4	No. 2 C. & B. Qtd.	138,000
4/4	No. 1 C. & B. Pl.	150,000
4/4	No. 1 C. & B. Pl.	150,000

CYPRESS

4/4	FAS	6,500
5/4	FAS	10,000
6/4	FAS	11,000
8/4	FAS	15,000

DRY HARDWOOD LUMBER

Anticipate a rise in prices by ordering **NOW.**
Will you let us quote on your requirements?

EDWARD CLARK & SONS LIMITED

807-9 BANK OF HAMILTON BUILDING - TORONTO, Ontario

SOUTHERN HARDWOODS

Dry Lumber in Buffalo for Quick Shipment

TENNESSEE SCENTED CEDAR

1″	74,000 ft.
1¼″	5,000 ft.

CHERRY

	1 & 2	No. 1 Com.	No. 2 Com.	No. 3 Com.
1″	112,500	176,900	45,500	58,000
1¼″	5,900	33,600	12,500	26,900
1½″	3,000	47,700	36,300	38,000
2″	8,000	22,200	64,900	9,500
2½″	6,500	3,300	2,200	.....
3″	25,700	4,500	3,300	.....
4″	5,900	.....	400	.....

CHESTNUT

	1 & 2	Clear Strips	No. 1 Com.	S.W. & No. 2 Com.
¾″	1,000	.....	51,000	103,000
1″	36,000	1,000	17,000	89,000
1¼″	151,000	300	80,200	199,200
1½″	77,500	.....	42,000	.....
2″	16,200	.....	17,300	116,200
2½″	4,000	.....	1,500	500
3″	2,100	.....	1,300	500
4″	1,500	.....	.....	.....

QUARTERED WHITE OAK

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
⅛″	6,500	.....	.....	.....
¾″	400	300	23,600	9,000
⅝″	2,800	.....	5,500	800
1″	40,300	20,000	49,400	27,000
1¼″	10,000	.....	5,000	.....
1½″	600	.....	2,400	.....
2″	.....	.....	25,100	5,700
2½″	2,000	.....	.....	.....

PLAIN WHITE OAK

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
⅜″	1,000	.....	.....	.....
½″	100	.....	.....	.....
⅝″	9,150	.....	1,000	16,900
¾″	227,800	.....	360,000	112,000
1″	39,300	1,700	86,000	85,200
1¼″	14,300	.....	1,100	5,000
1½″	97,300	.....	66,000	18,000
2″	62,000	.....	117,000	65,000
2½″	164,800	.....	56,500	3,000
3″	77,800	.....	65,800	14,400
3½″	5,500	.....	3,000	1,500
4″	76,000	.....	27,500	6,000

PLAIN RED OAK

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
⅜″	24,200	.....	.....	.....
¾″	204,000	.....	340,000	68,800
⅝″	4,000	.....	77,000	42,600
1″	48,200	3,150	46,000	126,400
1¼″	39,700	2,400	4,600	300
1½″	168,900	4,300	40,200	40,000
2″	110,500	.....	144,000	77,000
2½″	78,100	.....	21,000	3,700
3″	28,800	.....	20,500	7,000
4″	18,600	.....	8,900	.....

QUARTERED RED OAK

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
¾″	1,700	.....	9,700	500
1″	21,200	5,400	2,500	1,400
1¼″	2,000	.....	.....	.....
2″	.....	.....	7,400	.....

SAP GUM

	1 & 2	No. 1 Com.	No. 2 Com.	No. 3 Com.
1″	16,000	6,000	200	2,100
1¼″	.....	400	.....	12,000
1½″	2,400	6,000	13,500	2,500
2″	.....	5,700	10,400	25,800

QUARTERED SAP GUM

	1 & 2	No. 1 Com.	No. 2 Com.
4/4	.....	2,500	12,000
5/4	14,000	.....	.....
8/4	22,000	8,000	200
10/4	10,250	23,000	1,800

PLAIN RED GUM

	1 & 2	No. 1 Com.	No. 2 Com.
1″	29,300	10,000	11,500
1¼″	12,000	11,325	.....
1½″	15,000	17,300	9,500
2″	11,000	2,000	5,500

QUARTERED RED GUM

	1 & 2	No. 1 Com.	No. 2 Com.
4/4	6,000	12,000	7,000
5/4	13,400	7,800	.....
6/4	9,900	3,500	.....
8/4	22,100	22,500	3,600

POPLAR

	1 & 2	Bright Saps	No. 1 Com.	No. 2 Com.
⅝″	18,000	20,800	31,300	800
1″	41,000	9,200	111,900	78,800
1¼″	24,300	3,700	5,700	19,000
1½″	19,100	13,000	43,000	4,500
2″	.....	.....	12,500	24,500

Also Large Stocks of Ash, Basswood, Beech, Birch, Hard and Soft Maple.

THE ATLANTIC LUMBER CO., 310 Manning Chambers, Toronto

MANUFACTURERS SOUTHERN HARDWOOD LUMBER

Yards: BUFFALO, N.Y. Mills: KNOXVILLE, TENN.; FONDE, KENTUCKY

The London Lumber Co. Ltd.

WHOLESALE LUMBER

Will make attractive prices for 4/4 Birch and Elm; immediate shipment. Also have good stock in all thicknesses, Soft & Hard Maple, Ash, and Basswood. Write us for quotations.

487½ Richmond St. London, Ont.

The Bacon Lumber Co.

HARDWOODS:

OHIO and INDIANA
KENTUCKY and WEST VIRGINIA
NORTHERN BIRCH and MAPLE
SOUTHERN GUM, COTTONWOOD

306 Ulmer Bldg., Cleveland, Ohio

Sawed Veneer

Quartered White Oak
For Furniture and Panels

Plain Red Oak
For Interior Trim and Doors

Cypress
For Battery Separators

Manufacturing Uniformly Good.
Quality Unsurpassed

James E. Stark & Co., Inc.
MEMPHIS, TENN.

BEDNA YOUNG Lumber Company

Jackson - Tennessee

Manufacturers of

Quartered White Oak
Quartered Red Oak
and Other Hardwoods

When in the market for

High Grade Lumber

please let us have your enquiries.

Sales Office: 610 Lombard Bldg.
Indianapolis, Indiana

Hardwood Products Par Excellent

Buyers requiring an exact standard of manufacture plus lumber cut from good timber will find it in our band-sawn White and Red Oak, Ash, Gum and other Arkansas hardwoods.

In addition to affording a reliable source of supply for these items, we also offer you the practical convenience of filling out special schedules with finely manufactured Oak Flooring, square edge parquetry strips, oak trim and moulding, which can be shipped in the same car.

Ours is a service of unusual scope and value, which it will pay you well to investigate.

MEMPHIS
BRUCE
LITTLE ROCK

Correspondence invited

E.L. BRUCE COMPANY
MANUFACTURERS
MEMPHIS, TENNESSEE
Band Mill: LITTLE ROCK, ARKANSAS
Oak Flooring Plants: LITTLE ROCK; MEMPHIS

We specialize in Birch, Basswood, Hard Maple

	500M 4-4 Unselected Birch		500 M 4-4 Basswood		500M 4-4 Hard Maple	
	300M 5-4 " "		300M 5-4 "		400 5-4 "	
A	150 6-4 " "		200 6-4 "		400 6-4 "	
High	125 8-4 " "		75 8-4 "		600 8-4 "	
Standard	150 10-4 " "				400 10-4 "	
of	150 12-4 " "				300 12-4 "	
Quality	75 14-4 " "				75 14-4 "	
and	75 16-4 " "				100 16-4 "	
Service						

Sawyer Goodman Company

Marinette - Wisconsin

WE ARE TELLING THE PUBLIC: "BE SURE YOUR WALNUT IS ALL WALNUT."

AMERICAN WALNUT

"The Cabinet-wood Superlative."

WE ARE TELLING THE PUBLIC: "BE SURE YOUR WALNUT IS ALL WALNUT."

"FOR DISTINGUISHED SERVICE."

Genuine American Walnut earned high honors for its enduring qualities when used for aeroplane propellers and gun stocks during the war.

Genuine American Walnut does not warp, shrink, split, twist or splinter. (See report in Bulletin, Ohio Experimental Station, March, 1921.)

These same excellent properties make it the preferred cabinet-wood of furniture manufacturers in the "piping times of peace." (*The public likes it.*—"That helps some.")

The genuine American Walnut furniture and paneling of today will retain its good form and be a credit to its makers for centuries to come.

Words of praise come to us from those who have received the Walnut Brochure de luxe, an illustrated informative history of this historic wood. You ought to be familiar with it. May we send you a free copy?

AMERICAN WALNUT MANUFACTURERS' ASSOCIATION

ROOM 1019 616 SOUTH MICHIGAN BOULEVARD CHICAGO, U. S. A.

Dimension Stock you can depend on

One of the largest and best equipped Dimension Plants in the South offers you its facilities. Situated in the heart of the Blue Ridge Hardwood district. Capacity 1,500,000 Feet per Month.

CORE STOCK, Clear Flat Stock and Mouldings from Chestnut, Oak, Poplar, Basswood, Cypress or Tupelo Gum

Large Stock of Dry Lumber.
Perfect Kiln Drying.
Guaranteed Mill Work.

Won't you let us do for you what we have done for our own Northern Factories?

National Casket Co.
DIMENSION DEPARTMENT
Asheville, North Carolina

Reese Sheriff Lumber Co.

WILLIAMSPORT, PENNSYLVANIA

Manufacturers of

Northern and Southern Hardwoods
White Pine, Spruce and Hemlock

With special attention to **Oak, Chestnut, Poplar, Cherry, Walnut, Gum and Basswood.**

OUR MOTTO

REASONABLE PRICES—that you can afford to pay.
EFFICIENT SERVICE — that you have a right to expect
FAIR TREATMENT — that you can depend on getting

We would appreciate an opportunity of furnishing a portion of your lumber requirements.

BY MAKING TEST RUNS OF YOUR LUMBER

You will find that our stock will reduce your costs to a minimum and improve the quality of your product. Indiana hardwoods cost no more than the other kinds—then why not use them ?

We are the largest hardwood producers in Indiana and give below a partial list of stock on hand:

INDIANA QUARTERED WHITE OAK

	1s & 2s	No. 1 Com.	No. 2 Com.
1/2″	1 car	1 car	
5/8″	2 “	4 “	
3/4″	1 “	5 “	1 car
4/4″	3 “	4 “	4 “
5/4″	1 “	3 “	1 “
6/4″	1 “	3 “	
8/4″	1 “	2 “	

Also Clear and No. 1 Common Quartered White Oak Strips.

INDIANA QUARTERED RED OAK

	1s & 2s 6″ & up	1s & 2s 9″ & up	No. 1 Com.	No. 2 Com.
1/2″—3500′				
5/8″—1 car			1 car	
4/4″—3 car		1 car	3 “	1 car
5/4″—2 “		1 “	2 “	
6/4″—2 “		2500′	1 “	
7/4″—1 “		4500′		
8/4″—2000′		3000′	1 “	

PLAIN WHITE OAK

	1s & 2s	No. 1 Com.	No. 2 Com.
5/8″	1 car	1 car	
3/4″		4000′	
4/4″	2 “	4 cars	2 cars
5/4″	1 “	3 “	1 “
6/4″	1 “	2 “	
8/4″	3 “	2 “	
2½″	½ “	1 “	

PLAIN RED OAK

	1s & 2s	No. 1 Com.	No. 2 Com.
5/8″	2 cars	2 cars	
3/4″		5000′	
4/4″	4 “	4 cars	3 cars
5/4″	1 “	3 “	
6/4″	1 “	4 “	
8/4″	2 “	3 “	
2½″	2 “	3 “	

BLACK WALNUT—Steamed Stock

	1s & 2s	No. 1 Com.	No. 2 Com.
4/4″	1 car	3 cars	12000′
5/4″	1 “	1 “	9000′
6/4″	4000′	4000′	
8/4″	1 car	1 car	

1 car 5/8″ Log Run, not steamed.

WE ARE IN POSITION TO KILN DRY THIS LUMBER. ASK FOR OUR RATES.

We also have good stocks of Poplar, Ash, Beech, Hickory, Maple, Gum, Tupelo, etc.—Write us for prices.

Maley & Wertz Lumber Company

EVANSVILLE, INDIANA

MILLS AT EVANSVILLE, IND., GRAMMER, IND., and KEIRNS, MISS.

Stimson Veneer and Lumber Co.

(Inc.)

Office and Mill: McLean Ave. and Union Belt R.R.

Memphis - Tenn.

We sell only the product of our own mills and make band sawn lumber in all Southern Hardwoods.

We specialize in Quartered White Oak, Red Oak, and Red Gum.

With allied companies we make fifty million feet annually.

J. V. Stimson Hardwood Co.

Manufacturers and Exporters

Band Mills: Memphis, Tenn., Helena, Ark.

Memphis - Tenn.

STOCK LIST

QUARTERED WHITE OAK
- 3 cars 4/4" 1s and 2s.
- 5 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common .

QUARTERED RED OAK
- 5 cars 4/4" 1s and 2s.
- 10 cars 4/4" No. 1 Common.
- 4 cars 4/4" No. 2 Common.
- 2 cars 6/4" No. 1 Common and Better.

QUARTERED RED GUM
- 10 cars 4/4" 1s and 2s.
- 3 cars 4/4" 1s and 2s Fig.
- 2 cars 5/4" 1s and 2s.
- 2 cars 6/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 2 cars 5/4" No. 1 Common.
- 2 cars 6/4" No. 1 Common.

QUARTERED RED GUM, Sap no Defect
- 5 cars 6/4" No. 1 Common and Better.
- 10 cars 8/4" No. 1 Common and Better.

ASH
- 4 cars 10/4" No. 1 Common and Better.
- 1 car 12/4" No. 1 Common and Better.
- 1 car 6/4" No. 1 Common and Better.
- 2 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common.

SAP GUM
- 10 cars 4/4" 1s and 2s.
- 20 cars 4/4" No. 1 Common.
- 10 cars 4/4" No. 2 Common.
- 2 cars 4/4" 18" up Panel.
- 5 cars 4/4" 13-17" Box Boards.

PLAIN RED OAK
- 2 cars 4/4" 1s and 2s.
- 2 cars 6/4" No. 1 Common and Better.
- 2 cars 10/4" No. 1 Common and Better.

PLAIN WHITE OAK
- 4 cars 4/4" No. 1 Common Plain.

COTTONWOOD
- 2 cars 4/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 5 cars 4/4" No. 2 Common.

ELM
- 2 cars 4/4" Log Run.
- 10 cars 10/4" Log Run.
- 10 cars 12/4" Log Run.

MAPLE
- 4 cars 12/4" Log Run.

Dowels, Turnings, Knobs, Spindles, Buttons, Drawer Stops, Table Pins, Screwhole Plugs. Special Woodwork to order.

No 2 Dowel Pin

HENRY ROWE MFG. COMPANY NEWAYGO, Mich.

DRY STOCK

For Immediate Shipment

	SOFT ELM			SOFT MAPLE	
6905′	1″	—No. 1 C&B	14397′	2½″	—No. 1 C&B
3195′	1″	—No. 2 Com.		BASSWOOD	
41030′	1½″	—No. 1 C&B	1549′	1″	—No. 1 C&B
2356′	1½″	—No. 2 Com.	606′	2″	—No. 1 C&B
56880′	2″	—No. 1 C&B		BUTTERNUT	
10046′	2″	—No. 2 Com.	2584′	1″	—No. 1 C&B
110594′	2½″	—No. 1 C&B		HARD MAPLE	
26985′	2½″	—No. 2 Com.	31788′	1″	—No. 1 C&B
11750′	3″	—No. 2 Com.	243927′	1¼″	—No. 1 C&B
	WHITE ASH		227707′	1½″	—No. 1 C&B
87846′	2″	—No. 1 C&B	1796′	1½″	—No. 2 Com.
3072′	2″	—No. 2 Com.	217401′	2″	—No. 1 C&B
139960′	2½″	—No. 1 C&B	11410′	2″	—No. 2 Com.
13537′	2½″	—No. 2 Com.	38016′	2½″	—No. 1 C&B
18992′	3″	—No. 1 C&B	11091′	3″	—No. 1 C&B
608′	3″	—No. 2 Com.	2796′	4″	—No. 1 C&B
	HICKORY			BEECH	
650′	1″	—No. 1 C&B	3000′	1½″	—No. 2 Com.
1408′	2″	—No. 1 C&B	500′	2″	—Log run
	COTTONWOOD		250′	2½″	—Log run
1620′	1″	—No. 1 C&B	350′	3″	—Log Run
19956′	2″	—No. 1 C&B	100′	4″	—Log run
1196′	2″	—No. 2 Com.		BIRCH	
	BLACK WALNUT		15998′	1″	—No. 1 C&B
2873′	1″	—No. 1 C&B	22311′	1¼″	—No. 1 C&B
1151′	1″	—No. 2 Com.	11748′	1½″	—No. 1 C&B
	WILLOW		50157′	2″	—No. 1 C&B
1446′	1″	—No. 1 C&B	87172′	2½″	—No. 1 C&B
	CHERRY		7866′	3″	—No. 1 C&B
4747′	1″	—No. 1 C&B		PLAIN OAK	
2137′	1″	—No. 2 Com.	9369′	1″	—No. 1 C&B
	ROCK ELM		1107′	2″	—No. 1 C&B
12493′	2″	—No. 1 C&B			

The above stock is in our Battlecreek yard and we are so located that we can load and ship stock immediately upon receipt of your orders. We guarantee National Hardwood Lumber Association grades.

PAYSON SMITH LUMBER CO.

Plymouth Building - MINNEAPOLIS, Minn.

McLEAN MAHOGANY & CEDAR CO., INC.

American Hardwoods

WE SOLICIT YOUR ENQUIRIES

742 Ellicott Square, Buffalo, N.Y.

OAK

Plain and Quartered

Uniform Color—Soft Texture

Poplar, Ash

and other

Hardwoods

We carry 35,000,000 feet dry stock—all of our own manufacture.

Oak Timbers and Planking

The Mowbray & Robinson Co.

(INCORPORATED)

Manufacturers

Office: CINCINNATI, OHIO

MILLS

Quicksand, Ky.; West Irvine, Ky.

Canadian Representative:

A. K. Johuson, Traders Bank Building, Toronto, Ont

Thompson-Katz Lumber Co.

Manufacturers of

WHITE ASH EXCLUSIVELY

In dealing with us the wood worker and furniture manufacturer may rightly expect a better service, better value and a greater selection from which to choose his requirements. We have all grades and all thicknesses to offer—beautiful stock that we know will please you. Drop us a card to-day—we'll do the rest.

MEMPHIS, TENNESSEE

J. H. Bonner & Sons

Memphis, Tenn.

Mills:
Jonquil and Ruffwood, Ark.

Manufacturers

Band Sawn Hardwood Lumber

Write or wire for prices on

Gum, Oak, Elm, Etc.

Frank Purcell Walnut Lumber Co.

Plenty of logs like the portion of our stock shown above have made possible the million and a half foot stock of well manufactured American Walnut Lumber which we now have to offer.

Prompt shipment
All grades and thicknesses
Guaranteed Inspection

12th AND BELT LINE

Kansas City - Kansas

Nichols & Cox Lumber Co.

GRAND RAPIDS - MICHIGAN

We can ship promptly the following items. Can also kiln dry if desired.

2 cars	4/4	1st and 2nd	Sap Gum
5 "	4/4	No. 1 Com.	"
3 "	5/4	No. 1 Com. and Better	"
2 "	6/4	"	"
2 "	8/4	"	"
4 "	6/4	"	Qtd Sap Gum
5 "	8/4	"	"
3 "	0/4	"	"
2 "	12/4	"	"
2 "	4/4	"	Plain Red Gum
1 "	5/4	"	"
1 "	6/4	"	"
1 "	8/4	"	"
2 "	4/4	1st and 2nd	Plain Red Oak
3 "	4/4	No. 1 Com.	"
1 "	5/4	No. 1 C & B	"
1 "	6/4	"	"
1 "	8/4	"	"
1 "	4/4	1st and 2nd	Plain White Oak
2 "	4/4	No. 1 Com.	"
2 "	10/4	No. 1 Com. and Better	Birch
1 "	12/4	"	"
1 "	10/4	"	Basswood
5 "	6/4	No. 2 Com. and Better	Gray Elm
5 "	4/4 to 8/4	No. 1 Com. and Better End Dried	White Maple

Send us your enquiries for anything needed in Northern and Southern Hardwoods.

DIMENSION

My Specialty is

Dimension Lumber

For Manufacturers of

Wagons and Implements, Buggies and Autos, Furniture, Railroad Car and Track Material

Standard Sizes on Hand for Prompt Shipment. Special Sizes Cut to Order

SOUTHERN HARDWOOD LUMBER

C. B. COLBORN

Office, Dimension Mill & Yard
Belt Line at McLean.

MEMPHIS - TENN.

A name that should be on your inquiry list for Hardwood Lumber

American Column & Lumber Co.

Brunson Building, COLUMBUS, OHIO

—Manufacturers of—

West Virginia

Soft Yellow Poplar
Plain White Oak
Plain Red Oak
Quartered White Oak
White Oak Timbers and Plank

Chestnut	Butternut
Basswood	Ash
Maple	Cherry
Hickory	Walnut
Beech	Sycamore
Buckeye	Black Gum
Birch	Hemlock

Oak and Hardwood Dimension Stock

Steele & Hibbard Lumber Co.

ST. LOUIS, MO.

56 Years in Business

We carry a large stock of dry

Hardwood Lumber

25 Different Kinds
Quick Shipment
Write or wire for Prices

We specialize Oak cut from Mild Texture Missouri Timber with thin sap both plain and quarter sawed.

We ship also from Sawmills direct ; Red as well as Sap Gum and Poplar both plain and quarter sawed, Sound Wormy Chestnut, Cypress and Ash.

"Wire collect for prices or other information. Time is Money, delays pay no dividend."

St. Francis Basin Hardwoods

Kraetzer Cured and Air Dried

Tennessee Aromatic Red Cedar

Carloads and less or mixed with Hardwoods

"What Others Say"

"Your letter of February 15th received and we want to say that this was a very nice lot of lumber. It was good widths and lengths and well manufactured, dry stock and the grading was very liberal. We are sorry we cannot use more of this lumber at the present time. ***We received several cars from other manufacturers at a cheaper price but the lumber was not nearly as satisfactory.*** When we are in need of more stock we will take the matter up with you."

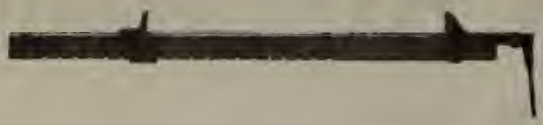
(Note—The above was sent us February 24, 1921 unsolicited. Name given on application).

GEO. C. BROWN & COMPANY

Home Office - MEMPHIS, TENN.

BAND MILLS, PROCTOR, ARK. CROOKED BAYOU, ARK.

BLACK BROS.
CLAMPS



Where Black Bros. Clamps are known, there is no second choice. Know them.

Carried in stock by leading dealers throughout Canada. Write for Bulletin, and name of nearest dealer.

The Black Bros. Co. - Mendota, Ill., U.S.A.

The Door Carrier System

Makes your dry-kiln doors steam-tight and saves time, heat, trouble and money.

Carrier lifts door clear of kiln and carries it down track. Returning, deposits door to rabbeted joint, where it is held steam-tight by its own weight. Applicable to old or new kilns.

Ask for catalogue.

DRY KILN DOOR CARRIER CO.
1117 Cornell Ave.
INDIANAPOLIS, IND.

Yellow Poplar Lumber Co.

Manufacturers of Band Sawed

Poplar Plain Oak
Quartered Oak
Chestnut Basswood

Capacity 50,000,000 per annum

SPECIALTY: Monogram Brand Oak Flooring

CANADIAN ENQUIRIES SOLICITED

COAL GROVE, OHIO, U. S. A.

Tennessee Lumber & Coal Company

Manufacturers and Wholesalers

APPALACHIAN HARDWOODS

Soft Textured White and Red Oak, Poplar, Chestnut, Southern Gum

OAK TIMBERS AND PLANKING CUT TO ORDER

Band Mills: Verdun, Tenn., Louvain, Tenn.

Submit your enquiries to our Sales office, Cincinnati, Ohio.

"Hartzell's Choice Walnut"

The way Walnut comes to us

COMING AND GOING

One constant stream of American Black Walnut from "Stump to Consumer" flowing through a steady, reliable and satisfactory channel.

"Geo. W. Hartzell"

Logs in the rough coming in Veneers and Lumber of the highest quality going out daily year in and year out covering a period of 35 years.

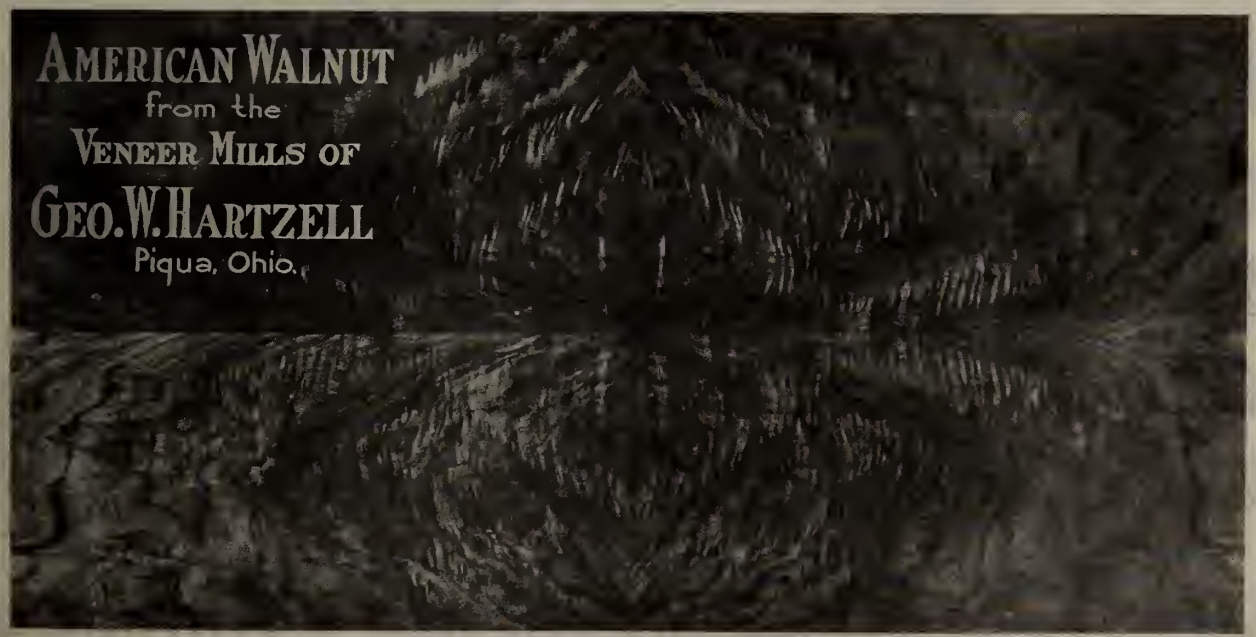
We rightfully claim your patronage because of "SERVICE and QUALITY," if there is any question in your mind about it

"Try Us and We Will Ship You the Convincer"

No Order too large, no Order too small to receive the close and careful attention it is our custom to give. That is a great part of our business, serving our customers.

"WRITE FOR SAMPLES AND QUOTATIONS"

Geo. W. Hartzell - Piqua, Ohio



The way it goes to our Customers

Highest Quality

St. Francis Basin Hardwoods

Band Sawmill - Marmaduke, Ark.

SAH
OAK
GUM
CYPRESS
TUPELO
SOFT MAPLE

The Vail Cooperage Co.

General Office - FORT WAYNE, Ind.

OUR EXPORT BRAND

Service LHC *Quality*

Prompt
SPECIAL
Plain White Oak
50 M' 1" FAS
30 M' 1¼" FAS
12 M' 1½" FAS
15 M' 2" FAS

Shipments
SPECIAL
Plain White Oak
70 M' 1" No.1 C&S
20 M' 1¼" No.1 C&S
20 M' 1½" No.1 C&S
15 M' 2" No.1 C&S

GUM
ASH
OAK
POPLAR
CHESTNUT

LIVERPOOL HARDWOOD COMPANY Inc.

50 Church St. NEW YORK CITY
Bank of Commerce Bldg. MEMPHIS, TENN.

MOULDINGS We are making more Period Mouldings than ever before. Orders should be placed early to assure your supply when needed.

KNOBS The Period Knobs we placed on the market a few months ago are proving very popular. If you have not received samples ask for them now.

ROSETTES A new Period item to accompany the knobs.

Waddell Manufacturing Company

Coldbrook and Taylor, N. W. Grand Rapids, Mich.

Announcement:—

Special Offerings

in

Mahogany and Walnut Veneer

Word from you will bring samples and prices

Mahogany Lumber* - *Every grade and thickness on sticks in our yards

Lewis Thompson & Co. Inc.

Colonial Trust Bldg. **Philadelphia, Pa.**

For Better Service

On January 10, 1887, there was organized by three young men, the Chapman and Dewey Lumber Company, with its office located in Kansas City, Mo.

On October 1, 1921, after thirty-four years of active business, the main offices of the company will be moved from Kansas City, Mo., to the Bank of Commerce Bldg. in Memphis, Tenn. This move has been ordered to increase our service to our customers. Inquiries will at all times receive the prompt and personal attention of one of the officers of the company. The Memphis office will be in touch, by long distance telephone with our yards and mills at Marked Tree, Arkansas. Our stock of 15,000,000 feet of Southern Hardwoods will be immediately available to fill your requirements.

We pledge you our word that the the thirty-four-year reputation of "Chapman & Dewey" lumber grades and quality will be maintained. We offer increased sales service at our new offices, and would welcome a personal call when you are in Memphis.

Chapman & Dewey Lumber Co.

Main Office: Bank of Commerce Bldg. Memphis, Tenn.

W. C. Dewey, Pres. **W. B. Chapman, Vice-Pres** **H. C. Dewey, Treas.** **A. Smith, Sales Manager**

District Sales Office - 500 Rialto Bldg., Kansas City, Mo.

E. H. Chapman, Manager

High Grade White Hickory

Why Pay High Freights on Waste Material? Stock sawed free and clear of defects to specified sizes. Waste eliminated at source. Operating numerous Mills throughout the choicest HARDWOOD BELTS in the United States.

"Buttcutt" Brand

Hickory, Oak and Ash

DIMENSION STOCK

Ski Billets, Picking Sticks, Hockey Sticks, Coupling Rods, Handle Blanks, Furniture Stock, Dowel Blanks, Rim Strips, Spoke Blanks, Shaft and Pole Stock, Gear Woods, Vehicles and Motor Woods for Bending Purposes.

Brown Brothers Company
MANUFACTURERS
11 Broadway - New York

The BRAND of QUALITY

Bigelow HARDWOOD PRODUCTS

The SYMBOL of SERVICE

A Complete Stock of Assorted Grades and Thicknesses

NORTHERN HARDWOODS

ASH, BEECH, BIRCH, BASSWOOD
SOFT ELM, ROCK ELM, HARD MAPLE

THE BIGELOW-COOPER CO.

BAY CITY - - MICHIGAN

WAYNE LUMBER CO.

Manufacturers and Wholesalers

Canadian Hardwoods

- - BIRCH AND MAPLE

OUR SPECIALTY

Elm, Ash, Basswood, Beech, Chestnut, Oak, and Poplar

110 West 40th St. New York

Canadian Representative,
D. Cote, 730A Champagneur, Outremont, Montreal

Band Sawn West Virginia Hardwoods

Our timber, of virgin growth in Greenbrier and Pocahontas Counties, limestone soil, gives a combination of Texture, Quality and Character that is most desirable to the Woodworking trade.

The most critical Hardwood users are among our best accounts. Why?

The W. C. Barlett Lumber Co.
Charleston, W. Va.

A "Quality" you will admire
A "Service" you will appreciate

We have the facilities for giving Canadian Woodworkers and Furniture Manufacturers a prompt service on straight or mixed cars of the following:

Ash, Oak, Gum, Poplar, Hickory, Walnut, Chestnut, Beech, Maple, Elm, Sycamore, Cottonwood.

Soft textured Plain and finely figured Quarter-Sawn Red and White Oak our specialty.

J. V. Stimson & Company
OWENSBORO - KENTUCKY
Bandmills Owensboro; Campbellsville, Kentucky

D. E. Hewit Lumber Co.

Huntington, W. Va.

MANUFACTURERS

West Virginia Hardwoods

(Not Better than the Best but as Good as the Best)

FAS Plain White and Red Oak
No. 1 Com. Plain White and Red Oak
Implement Oak
Sound Wormy Chestnut
No. 1 Common and Better Chestnut
Hickory Plank
Poplar and Basswood

Burns & Knapp Lumber Co.

Manufacturers of

Southern Hardwoods

Plain White and Red Oak, Dimension Oak, Hickory, Ash, Chestnut, Poplar, Basswood, Walnut, Maple, Beech, Butternut.

CONNEAUTVILLE, ——— PA.

We list below, items of our own manufacture, band sawn, that we are in a position to ship promptly.

1/2", 5/8, 3/4, 4/4, 5/4, 6/4 & 8/4 Quartered White Oak

3/4, 4/4, 5/4 & 6/4 Qtd. Red Oak

5/8, 3/4, 4/4, 5/4, 6/4 & 8/4 Plain Oak

4/4, 5/4, 6/4, & 8/4 Sound Wormy Oak

5/8, 4/4, 5/4 & 6/4 Plain Sap Gum

4, 5, 6, 8, 10 & 12/4 Qtd. Sap Gum

4, 5 & 6/4 Plain Red Gum.

4, 5, 6, 8, 10 & 12/4 Qtd. Red Gum

4, 5, 6 & 8/4 Tupelo Gum.

5/8, 4, 5, 10 & 12/4 Ash.

5/8, 4, 5, 6, 8, 10 & 12/4 Elm.

5/8, 10 & 12/4 Maple.

4, 5 & 6/4 Cottonwood.

MAY BROTHERS Office and Band Mills: MEMPHIS, TENNESSEE

OTIS
TRADE MARK

Tabasco
Honduras

ESTABLISHED 1867
INCORPORATED 1886

Laguna
Mexican

MAHOGANY

Rarely are such stores of precious wood to be found as may be seen in our yards. Across the seas from tropic lands it comes. From thick jungles where the light of day but dimly penetrates and where tangled native paths make difficult the bringing out of timber. Here the black man labors, risking life from jungle dangers, that supplies will not diminish and your orders may be filled.

Twelve million feet per year is the capacity of OTIS mills. An adequate supply is always on hand for prompt shipment. Get our prices.

Otis Manufacturing Company

Peters Avenue and The River

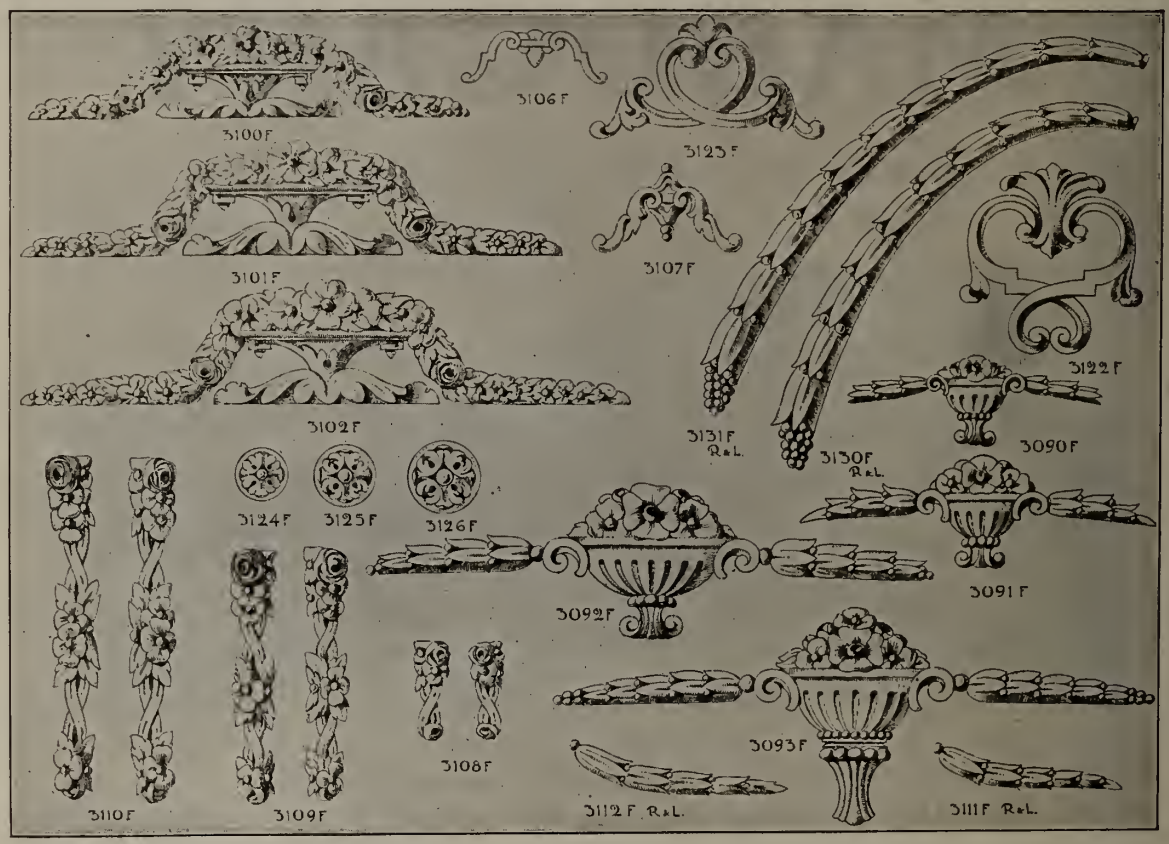
NEW ORLEANS, LA.

Chicago Office: Room 208, 128 N. Wells Street

PERIOD CARVINGS

for

FURNITURE



Largest Manufacturers of Imitation Wood Carvings in the World
Quality the Best — Prompt Shipment

Unlimited facilities for the manufacturing of high grade period wood carvings in composition and wood fibre. Reproductions of exclusive designs our specialty.

CATALOGUE SENT ON REQUEST

THE DECORATORS SUPPLY COMPANY

ARCHER, LEO AND LIME STREETS
CHICAGO

THE BEST IS NONE TOO GOOD

WE manufacture but one grade of lumber—the best. Because it has been our experience that most woodworkers demand only the highest grade. They believe the best is none too good. And when you consider the prices we are able to quote, it isn't worth while accepting a lower grade, anyway.

Why not get in touch with us?

OAK - POPLAR - GUM

Memphis Band Mill Company

"Makers of high grade lumber"

QUALITY

Memphis - Tennessee

SERVICE

Efficiency Marks Every Step of Our Service to You

Exact photograph of alley in our yard

White and Red Oak

Plain & Quarter Sawed Red Gum

Our Specialty Quarter Sawed Red Gum in Plain and Figured Wood

From the cutting to the delivery to your hands, our entire stock receives the most careful attention. All the excellence of quality and the beauty of the wood is kept just as it is when cut. When next you are in need of Oak, Ash, Elm, and Cypress of first class quality and in perfect condition write us. We can ship promptly.

BARR-HOLADAY LUMBER CO.

BAND MILL AT LOUISE, MISS. GREENFIELD, OHIO

WIS

This yard was BUILT for perfect drying. The appearance of the piles will convince every man who knows hardwood lumber.

Lumber Can't Be ALWAYS Good Without Perfect Piling

The *correct* drying of hardwood lumber is a science based on definite formulae. Recognizing this, our yard was ***built*** to insure the most perfect possible drying.

Everyone familiar with lumber will recognize what the appearance of the piles in the accompanying photograph means. They are your guarantee of flat, straight, clean lumber.

Our list includes the standard species and grades of southern hardwoods with NOTHING PICKED OUT, and has behind it a comprehensive and conscientious desire to give the customer his full measure of value and service,

Wisconsin Lumber Company

Chicago, Illinois

BAND MILLS, DEERING, MO.

"CHICAGO MILL"
DIMENSION STOCK
FROM
SOUTHERN HARDWOOD LUMBER

Our Cairo, Ill., Plant Largest in Operation

Exclusively engaged in the manufacture of DIMENSION STOCK
(Kiln Dried or Air Dried)

Dimension Lumber Kiln Dried Means:

1. **The elimination of waste.**
2. **A saving of at least 40% in freight.**
3. **Lumber delivered at the woodworker's plant ready for immediate use.**
4. **A quick turnover and minimum investment in lumber.**

The benefits to be derived from the use of Chicago Mill Dimension Lumber are cumulative. In the long run it means lower production cost for the finished article.

For particulars and prices address

Chicago Mill and Lumber Company

FROM
Sycamore
Ash, Elm
Oak, Gum
Cottonwood
Cypress, Maple

Dimension Lumber Department
111 WEST WASHINGTON STREET
CHICAGO, ILLINOIS

FOR
Furniture
Automobiles
Drawer Sides
Kitchen Cabinets
Garment Hangers

SOUTHERN HARDWOODS

Unexcelled Quality and Service

Prompt Shipment — Dry Stock — Uniform Quality and Inspection
Band Sawn and End Trimmed — Full and Uniform Thickness — Good Run of Widths and Lengths

Twenty-five years of service to the most exacting users of quality hardwoods enables Paepcke Leicht to help you get your exact requirements in southern hardwoods no matter what they may be.

This experienced service is impartial,—its purpose is to help you select the wood best suited for your use—uniform in quality and of the most economical grade which will prove entirely satisfactory for the job.

We Specialize in Oak and Gum

PAEPCKE LEICHT LUMBER COMPANY

GENERAL OFFICES—Conway Building
111 West Washington Street, Chicago, Ill

BAND MILLS—Helena, Ark., Blytheville, Ark.
Greenville, Miss.

ESTABLISHED 1892 INCORPORATED 1916

ROBT. BURY & CO., Canada

LIMITED

1 Spadina Avenue, Toronto

LUMBER
Mahogany, Walnut, Qtd. and Plain Oak, Red Gum, and all Canadian Hardwoods.

VENEERS
Single ply, sheet stock or dimension, all woods.

THREE-PLY
Birch, Fir, Cottonwood, Basswood, Oak, Mahogany, Walnut.

FIVE-PLY
Oak, Mahogany, Walnut, and Birch.

Head Office and Veneer Warehouse
1 Spadina Avenue, TORONTO

Lumber Yard, Dry Kilns and Mill
Foot Spadina Ave., TORONTO

EASTERN BRANCH—55 ST. FRANCOIS XAVIER STREET, MONTREAL

CANADIAN
WOODWORKER
and
Furniture Manufacturer

A Monthly Publication of Trade News and Practical Information, reaching the factories producing Interior Finish, Doors, Sash, Flooring, Boxes, Aeroplanes, Furniture, Pianos, etc.

Woodworker Publishing Company, Limited
345 Adelaide Street West - - - - - - TORONTO
Branches:
Montreal, Winnipeg, Vancouver, New York, Chicago.
Subscription, $2.00 a year; foreign, $2.50.

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Vol. 21 Toronto, September, 1921 No. 9

Is Business on Upgrade?

Is the much talked-of turning point from which business is expected to show a slow, sound, steady improvement a thing of the past? During the last few weeks furniture has been in stronger demand. Furniture manufacturers look for a busy fall. Building is on the increase and allied lines show signs of awakening.

Figures issued by MacLean Building Reports, Limited, covering August 1921, show an increase of over 100 per cent. over the total for July 1921. The figure as given is $36,307,200. This is by far the largest monthly aggregate since August 1914. This total is divided as follows:—residential $5 872,300., business $10,049,000., industrial $7,935,900. and engineering $12,450,000. The total for the first eight months of 1921 is $165,812 100. as against $192,470,200. for the same period last year.

An analysis of these figures shows that work was started on new factories and industrial plants to the value of $7,935,000. This is an increase of nearly 100 per cent. over the combined totals for the preceding seven months. That this is an indication of better times, cannot be disputed because industrial expansion in times like these is planned and carried out on a conservative basis. The manufacturers of Canada must have good reasons for embarking on this increased construction program.

Let us all put our shoulders to the wheel and do our part to bring about a resumption of business on a more substantial scale. After all, we as individuals are responsible for it is our attitude and our actions which mould and control general conditions.

Standardization Has Practical Value

Many favorable comments have been made on the suggestions contained in the article entitled "What About Standardization?" which was published on this page in the August "Canadian Woodworker and Furniture Manufacturer." The following remarks taken from a letter received from a large American woodwork manufacturer deserve more than passing attention for they represent on opinion based on the knowledge gained through sixteen years' experience in the production of standardized frames.

"We note with interest your remarks in regard to standardized window and door openings. This is a matter that is of importance to the entire mill-working industry. As you know, there are a large number of different opening sizes used throughout the United States and Canada and there is really no justification for the differences except tradition. The fact that these special opening sizes are used undoubtedly costs the builders of homes considerable money on account of the extra expense in making these special openings.

"We began manufacturing standardized window and door frames sixteen years ago and make all of our frames for the standard Western opening size which allows 4" in width and 6" in height for wood over the glass size on a 2 light window; and have either induced our customers to change to the Western openings or have kept out of the markets where special opening sizes are required.

"Without a doubt, if opening sizes were standardized there would be a tremendous saving to the consumer on windows and sash as manufacturers would be able to make a considerable reduction in the cost of manufacture if they were not required to make so many different sizes of stiles and rails."

Purchasing Power of Furniture Industry

According to figures recently issued by the Department of Statistics at Ottawa, covering the furniture industry in Canada for the year 1919, the value of the furniture produced was in round numbers $25,000,000., the exact figures given being $24,966,305. The value of the raw material used is given at $9,666,000. and is made up as follows:—Lumber $3,371,000.; veneer $340,000.; furniture frames $482 000.; furniture hardware $552,000.; fittings and finishing supplies $284,000.; glass and mirrors $601,000.; paints, oils, varnishes, stains, etc., $483,000.; iron and steel castings $198,000.; canes and reeds $87,000.; leather and imitations $313,000.; tapestry $642,000.; satins, velvets and velours $196,000.; tow, moss, hair, etc., $201,000.; other upholstering materials $351,000.; other furniture materials $816,000.; wire $77,000.; mattress ticking $86,000.; twine and buttons $34,000.; other mattress material $549,000.

Printers Still on Strike

The printers' strike is entering its sixteenth week. In spite of this handicap we are gradually bringing the "Canadian Woodworker" back to its pre-strike standard. We wish to thank you for the support you have given us.

Basic Rates in Furniture Work

Mr. Snaith Presents New Idea which May Revolutionize Time Study and Piece Rate Practice — One Practical Man Writes: " This Idea Advances the Woodworker About a Century, to Where He Belongs"

By WM. SNAITH, C. E., Associate Engineer with Forests Products Engineering Co., Chicago.

The setting of accurate rates for piece-work in furniture factories by means of time studies involves a number of considerations which rather sharply differentiate it from rate setting in other branches of industry. It need hardly be pointed out that accurate rates can only be established from the analysis of carefully made time studies. Records of past performance or the best judgment of individuals are sometimes used as a basis for rates but this is invariably unsatisfactory. In woodworking operations the cutting speeds are extremely high compared with metals of any kind. Hand feeds are the rule rather than the exception and in many other ways conditions are the reverse of those obtaining in the iron industry. All operations consist of handling and cutting and it is not at all uncommon to find the handling time amounting to 20 times the cutting time.

It is a great advantage to express all rates in terms of time instead of money, or, in other words, to establish standard times which can subsequently be expressed in dollars and cents if desired. The reason for this lies in the fact that rates of pay inevitably vary, but unless the conditions under which an operation is performed are changed the standard time established by time study will not change. This will be further emphasized in the discussion which is to follow.

Special Problems Presented

As a branch of the woodworking industry the furniture business presents a number of special problems of its own in rate setting. There are few manufactured articles which consist of so many component parts as the average piece of furniture, such as a buffet or dresser. Even a simple part will call for quite a few separate operations. Each operation has to be rated, so there will be quite a few rates for each article. Most furniture manufacturers find it advisable to make a varied line. This multiplies the number of rates to be calculated. Now the "life" of a design of any article will not average much over two or three years, except in the case of articles as standard as kitchen chairs and tables. Hence the "life" of the multitude of rates mentioned will be correspondingly short.

Imagine a plant working on the daywork system and changing to piece work. Standard times and piece rates would be set on all operations on all parts of every article. Some of those articles would be on their last run and these rates would die as soon as that run were completed. Others would die in a few months. In a year and a half 50 per cent. of all the rates would have similarly died of old age, and in three years the last of the rates so carefully figured out at the start would have passed into oblivion. Manifestly some method of replacing these rates with new ones must be devised. As new lines are designed new rates must be calculated. It is very evident that if time studies had to be made each time there would have to be an organization and staff to handle the work. This would involve delay and expense and is therefore impracticable. The new lines might be compared as to general similarity with some of the old ones and rates established on that basis. Later on newer rates might be based on these rates and so on. After a while these rates would be about as satisfactory as a straight guess. This method is equally impracticable.

Accurate Basis for Standard Times

The solution of the problem is to be found in basic rates. Every operation consists of a number of motions. Some of these depend on the dimensions of the piece and others on the class of work done on it. If time studies are made, so that the times of the component motions are accurately determined, it is a comparatively simple matter to analyse the times so observed and arrive at standard times for the various parts of the motions. These times may be re-combined for similar operations on parts of somewhat different design with absolute certainty that the standard time thus arrived a will be correct.

As an example of what is meant the operation of shaping may be taken by way of illustration. The handling time will depend on the kind of fixture or the absence of any, and the cutting time will be affected by the length of cut and the class of work. Size of piece may be a factor, and the kind of wood may exert some influence, although actual observation fails to indicate that this has a measurable effect. In the simplest case the operation will consist of three motions:

(a) Pick up piece,
(b) Cut,
(c) Put down on truck.

In a more complex case we might have:

(a) Pick up 2 pieces,
(b) Clamp in fixture A,
(c) Cut,
(d) Turn fixture around,
(e) Cut,
(f) Unclamp and put 2 pieces on truck.

Time studies reveal that the time to pick up one piece and place it on the table of the machine varies but slightly. It will take slightly longer to pick up 2 pieces, but this time will maintain a constant average. If the pieces vary considerably in size it is found that they can be divided into two or three classes, and the time for each class will be constant. The same will be true of the times for clamping into a fixture, once the times for the particular type of fixture has been determined.

Factors to Consider

It is found that the depth and width of cut and the class of work affect the speed of cutting. But for the same class of work the cutting speed is constant, and when the various classes are determined from analysis the time to perform the cutting operation is arrived at by multiplying the length of cut by the rate of feed for he rlass in question. One slight modification may be noted as applying to this particnlar operation, the expedient used is applicable to other operations also. It takes longer to shape sharp corners than straight

work. To take this into account time studies are made and show that each corner is equivalent to a certain number of lineal inches of straight cutting. This allowance is made before multiplying the length by the feed when one or more corners are to be cut. In actual practice the calculations involved can be made with great celerity.

By means of time studies all the operations are similarly analysed. It is found that in many operations some of the motions are the same and can be done in the same time. Thus the standard times become a check one on the other and the basic rates calculated from them consistent with one another. In other words, all operations call for an equal effort or expenditure of energy. There are no "easy" jobs and no "hard jobs," all call for only a fair average day's work of an average good operator. Better conditions produce better work and more of it.

Estimating is put on a more certain and scientific basis by calculations based on "basic rates." The exact effect of changes in design or methods can be determined before the changes are made and unless a saving is indicated the existing conditions can be maintained.

Provide Foundation for Piece-work

Of course the chief use of basic rates is as a foundation for a piece work system. They occupy the position of standards whereby performance may be measured. It is developed from the careful study of an operation, that it can be done ordinarily in one hour, due allowance being made for personal time, care of machinery, incentive, etc. If one man takes 1.2 hours to do the job his efficiency is 80%, while that of the man who does it in .80 hours is 120%. Without such a standard these relative efficiencies could not be accurately measured. If the pace of the fast operator were adopted as standard the average man could not obtain it and would be discouraged. If the pace of the slow man were adopted the fast man would "beat" the rate to such an extent that he would be overpaid and a loss would be entailed.

A word of caution may not be out of place concerning the limits inside of which basic rates will apply. In what has been said an important assumption has been made. This is that the product is made in comparatively small lots, the average size of which varies within comparatively narrow limits. When quantity production is the rule the basic rates will have to be re-determined for that condition. It is obvious that rates based on jobs lasting a few hours each can be very materially improved on when an operator can be kept continuously at the same work week after week or month after month. These later conditions do not apply generally to the furniture business and hence the use of "basic rates" is simplified and offers a solution to a problem which has the appearance of being so vast that few manufacturers have had the nerve to attempt its solution in a scientific way.

CAN'T AFFORD THAT NEW MACHINE?

One of the successful business men in America was recently asked by a youngish man, who had but recently started his own company, for some helpful pointers. After listening to an outline of the youngish man's affairs the veteran recommended that he do a certain thing.

"But I couldn't afford such an expenditure," objected the youngish man.

Then the veteran gave him this morsel of business wisdom:

"Don't count only the cost. Figure what it will bring in return. No outlay is costly that more than pays for itself."

Business men of foresight in all lines of industry make aggressive constructive policies backed by vigorous advertising pay handsomely where the timid fail and fall by the trade wayside.

Walnut cabinet in Spanish style.

Conditions in U. S. Furniture Market

A glance at the following figures, which are complied from a questionnaire sent out by the "American Furniture Manufacturer" give a fairly accurate outline of the conditions which exist in the American furniture field. The information given covers both the manufacturing and retail branches of the industry. While conditions on both sides of the border are not by any means identical or subject to the same governing influences yet as a general rule where business is good in one country it seems to be about the same in the other.

In Manufacturing Field

Told in percentages, the factory symposium is this:

Do you find orders increasing?
Yes—82%.
No—18%.

Is the trend toward better furniture, not necessarily higher priced, but from a quality standpoint?
Yes—94%.
No—6%.

Are the new designs or the old selling the best?
New—68%.
Old—32%.

Are you carrying stocks of merchandise to any extent, or making up orders as these come in?
Yes—61%.
No—39%.

Are orders you are now receiving for future or immediate delivery?
Immediate—92%.
Future—8%.

Are your material prices stiffening or softening?
Stiffening—54%.
Softening—46%.

In your opinion, will present prices stand throughout 1921?
Yes—80%.
No—20%.

What is your opinion of the proposed advertising campaign to the public; will it increase business?
Yes—93%.

In Retail Field

In your opinion, will the fall and winter months yield more sales than the first half of the year?
Yes—66%.
No—34%.

Are things picking up noticeably?
Yes—52%.
No—48%.

Are your sales for the last three months above or below those of a year ago?
Yes—24%.
No—76%.

What kinds of merchandise are moving the most rapidly?
Floor coverings, cheaper and medium lines in bedroom and dining room furniture, bed, springs and mattresses, also upholstered pieces.

Is the public demanding "better furniture" —that is a higher grade of merchandise (not necessarily higher-priced) than heretofore?
Yes—60%.
No—40%.

Are your local conditions favorable to increased business this fall?
Yes—50%.
No—50%.

Is building going on in your locality?
Yes—57%.
No—43%.

Are collections keeping up?
Yes—45%.
No.—55%.

What is your opinion of the proposed advertising campaign to the public; will it increase business?
Yes—78%.
No—22%.

Red Cedar as a Moth Destroyer

Some doubt is often expressed as to the value of Tennessee Aromatic Red Cedar as a moth preventative and destroyer. Many people seem to be of the opinion that the moth-destroying properties of this wood are over-rated. This is not the case; in fact judging from a report issued by the Department of Agriculture at Washington, D.C., the insect-destroying property of this wood is under-rated rather than over-estimated. A number of experiments were carried out in which live moths were introduced into cedar chests, together with suitable flannels on which they could feed. In practically every case it was found that in the course of a week or two all the moths died. Similar experiments were carried on with partially developed larvae, and while it was found that they were able to resist the destroying property of this wood for a longer period than the fully-matured moths, yet in the long run the effect was the same. While these experiments were being conducted, check experiments were carried on in which moths were introduced under similar conditions into ordinary wooden boxes. When the results of the different experiments were confirmed, it was found that while the moths in the red cedar chests died, those in the ordinary boxes were not only very much alive but had increased in number.

In most mills more oil is wasted than used. Half of this waste is caused through not scrapping old and broken oil cans. Such vessels will waste more oil in a week than would buy a new oil can.

Most folks do not think so, but there is an art in piling a stack of timber so it will be weather-tight, and dry without any undue warping.

Scientific Management in Millwork Industry

Operators of Woodworking Plants not Making Most of Opportunities — Efficient Organization Developes Business — Outline of Complete Organization for Millwork Factory

By ALBERT STEVES Jr., Steves Sash & Door Co., San Antonio, Texas.

We, in the sash and door business, must, in these piping days of peace and new found competition, be a sort of a mixture of lawyer, doctor, engineer, preacher, and good fellow, and if we lack any one of these attributes, we automatically place ourselves in the rear rank of present-day activities. I have come for the purpose of throwing the spot-light on such leaders in our industry, who have gone forward in a manner which deserves attention, and to assure you that it is a pleasure and an honor to do so.

One of the most interesting things in any business man's life, is to see the service which he can render. By service is not meant the old hackneyed, advertised, thread-bare phrase of "Quality and Service," but now it means the building up of an organization with your eyes to the front, never thinking of dollars and cents except as an incidental proposition. It is true that all business is primarily conducted for gain; a financial, substantial, mtaerial gain, but the world has come to look upon a business man as something more than a tradesman; has come to look upon the laborer as an artisan, and the three estates as recognized in the generation just ahead of us, do not stand as pre-eminent now as they did in the past; and in the next generation, the scientific business man, the man who has put his brains into his work and studied his problem, will not be in the class with the man who at one time was so in the minority as to power.

Still Learning and Progressing

The business man of to-day is at school. It is mostly a school he is building himself, and the business man of the next generation is going to a scientific school of business, just as the doctor, the lawyer, and the preacher, have done in the past, before he ever really enters the real arena of business itself. The idea of turning a young man loose with a big business (or any kind of business for that matter) in which he has had no schooling or training, has to be discarded, and, furthermore, is being discarded; so much so that practically every university in this country worthy of the name has to-day a department for schooling men in business methods. Those of our fathers who were fortunate enough to have gone through high school, and even those who finally got to college, always topped their course with a three to five months' business-college course, which taught them the rudiments of bookkeeping, and that was all. To-day bookkeeping is taught in the grade schools, but the theory of business, of finance, of labor, of statistical information, of trade barometers, and the like, are all being studied by all worth-while business men, generally, during office hours.

Then there is the tremendous field of advertising. The average business man of yesterday will tell any advertising agent who comes into his office that he (said business man) knows more about the sash and door game than the advertising agent, who may only know that a door is made to pass through, and a window is made to let air and light in. The agent, very naturally, knows little, or perhaps nothing, of millwork—his field is not production—it is attracting attention to the finished product. Said advertising man has been taught, however, the fundamentals of business and it is on these fundamentals alone that he works.

Thorough Grasp of Fundamentals

All men in the sash and door game must begin, even at this late a day, with fundamentals. Unfortunately, too many of them have never considered fundamentals, and do not to-day. To them a day's work has to be gotten through with, so you might worry along with it and get it over with. However, the scientific manager does not feel that way about his business; he is glad when the sun comes over from the East, and sorry when it is time to go home. His office, in the first place, is not the usual dump, or hole in the wall, but it is a well ordered, well lighted, well ventilated place in which to work, and is in proportion and commensurate to the amount of work that his office must do in relation to the production end of the business. Fine books, and large adding machines, and beautiful desks, and lots of telephones, filing cases, and the like, do not make a scientific business. Any institution in which only brains have been put, and the heart has not been allowed to show itself, is not a scientifically managed business. You will please understand that I am preaching that a man's business must be a pleasure, and his pleasure must not alone be guided by his mind. In hiring his people, he must consider various qualifications, but the personal element must enter into every human machine that is employed. In other words, there must be a point of contact, and if this point of contact is overlooked, the wrong employment must not be given nor taken. I mean there must be complete understanding which does not necessarily come through intimacy.

My idea of co-ordination in a medium sized sash and door business is something like the following diagram:

Qualifications of a Manager

I presuppose, of course, that it is a chartered concern with a duly elected board of directors by the stockholders, and let me say in passing, that I always consider it a good idea to have some of the employees, or at least department heads, as stockholders. The manager of the institution need not necessarily be a member of the board of directors, but he certainly should be a stockholder. I shall set forth from time to time throughout this paper my ideas about qualifications of the manager without setting forth any sequence here; suffice it to say that all of the dependability and trust possible must be imposed in this most important position in the business, and all co-operation for successful administration should be given by both the stockholders, directors and department heads.

The temper of a manager is one of the biggest assets or liabilities that any concern can have. It might be all right for some supernumerary to lose his head once

in a while, even though that is not desirable, but the director of any organization must stay on an even keel. It doesn't mean that he must never get angry, but that he must never show it in any way. Also, one of the greatest mistakes would be to get angry, and then over-ride department heads. It doesn't necessarily mean that he is losing his prestige, or his power or his authority by getting after some sweeper in the mill, or some stacker in the yard, or some poor girl in the office. It doesn't mean that; but every time that he over-rides his authority or loses his head his business is hurt just that much, and in proportion to the loss

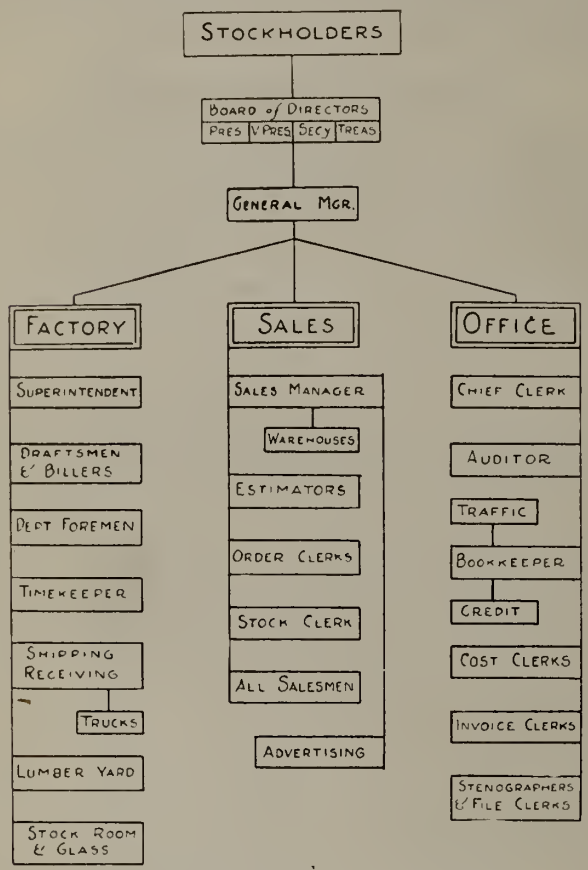


Chart showing distribution of responsibility

of his head. Also, there are some men who think when they start work in the morning that everything should be a bed of roses from the time that they arrive until they leave, and that the land of milk and honey is their business. The worth-while man looks for trouble; that is, he looks for a job, and just because things do not run smoothly he does not get angry, because he does not expect them to run smoothly—the first-class man does not expect things to always run smoothly; it is only the pee-wee who gets angry because things do not run on a greased sliding board, and unfortunately, there are a terrible lot of pee-wees.

A manager of any institution who gets in a "humdrum" fashion, or who does not attend to anything but his office, should be excused from his position by his board of directors as soon as convenient. Just about half the work that a manager does should be at his office or for his company directly. Any manager who does not take an interest in civic affairs—and the war certainly taught us how to handle civic affairs—should not be retained in the position he holds, or better, he should be asked before the position is given to him whether his qualifications are such that he is equipped to work in a general field shoulder to shoulder with men of every business. The Chamber of Commerce, the Rotary and Kiwanis Clubs, or any number of like organizations, offer fertile fields in which a man can show his ability. I have seen supposed executives who "cannot get away," or executives who attend to everything and do nothing worth while. There are, of course, businesses that have succeeded in piling up huge bank balances by methods of this sort, but the business and the executive merely tried to "get by," and the deplorable fact is that they think that they did.

Co-ordination of Departmental Activities

The purchasing department should be under direct supervision of the manager. Any business with co-ordinate heads should have the responsibility of the purchasing of various items, even merchandise, placed in the hands of the department heads. However, in this particular instance, above all others, the manager should exercise the closest scrutiny.

It is much to be desired that the closest of contact be maintained between the heads of departments, and certainly between whatever co-ordinative branches are set forth. The friendliest feeling must exist not only among the department heads, but among all the different men and women who go to make up one big family in any one organization. The spirit of friendly rivalry is, of course, greatly to be desired and looked for. Instituting dining rooms and service clubs and whatever you choose to call organizations that really meet out of business hours, either for safety, or for insurance, or for any other activity that is of vital importance to the employees—these always come back to the company with interest compounded. Particularly has all this been proven during the last two years when there has been such a spirit of unrest, even among the most satisfied of workers.

In the factory the most important item, of course, is the cost system. The superintendent should have under his immediate jurisdiction not less than four or five department heads, two or three draftsmen and a timekeeper. The factory heads or foremen should be responsible for their men and this makes a complete sequence, with the exception of the shipping department. The shipping department, of course, has delivery wagons and trucks, as well as the receiving department and local shipments, directly under their jurisdiction, and this work must be properly co-ordinated between the chief clerk and superintendent. Such management is extremely simple when properly worked out, but it is not as simple as it seems on paper. The only simplicity of it is that there must be only one rule over which there must be no deviation whatsoever. The matter of industrial remuneration is the one that has received the greatest amount of care and attention since the war. The superintendent should be given authority to handle this remuneration after a clear-cut policy is defined to him. The policy of the open shop or the American policy of equal rights to all and special privileges to none, should, in all cases, be impressed upon all superintendents.

Ninety-eight per cent. of all the trouble between employer and employee in industry is superinduced by the pestiferous, non-productive outsider who is sedulously busy telling those on the inside just how they can get more by doing less. These self-appointed guardians of the so-called oppressed, assume that the wage-earning masses are fools, and need experts to tell them how to deal with their employers. What red-blooded person can blame Judge Gary for refusing to

deal with a piece of communistic mistletoe like Foster, and others of his stripe, who thrives only upon the sweat of other brows? Detroit, whose record of remarkable growth, as revealed by the census, surprised the nation, was designated at the Montreal convention of the American Federation of Labor as "The Open Shop City." Whether the city's increase of one hundred per cent. in population in ten years, with 1,000,000 people and many great industrial establishments to its credit, can be attributed entirely to its freedom from domination by trade unions, the fact remains that in the most open of all open shop cities in the United States the persuasive arguments of the unions have failed, their theories have proven false—wages paid in "the open shop city," the city to which the American Federation of Labor would extend its influence, drew thousands of trade union men from closed shop towns. And these men were glad that the industrial "jugernaut" did not tramp them down; they were happy that the open shop was not closed to them.

The Moss Plan of industrial remuneration is one of the very best that I have seen applied to the sash and door industry. Mr. Moss, as you know, is the President of the American Sash and Door Company of Kansas City, and is one of the most able thinkers of our industry. His plan is to pay a preferred dividend to the stockholders from six to ten per cent.; and after that is paid, to consider the employees from the president to the sweepers as stockholders, using as a basis the annual wage of each employee. Group insurance is also a very splendid thought for the employees. This is given to them after a certain period of service, and is merely a life insurance policy of from five hundred to two thousand dollars, the premium which company pays. This is a form of additional pay, which is very much in use, and has worked out some very splendid results.

Intimate Knowledge of Costs

The chief clerk, or office manager, has under his control the bookkeepers, of whom there should be at least two; also, invoice clerks for the proper figuring of all charges, as here is the greatest leakage. The cost system should be attended to by the office for the benefit of the factory. Not that the chief clerk has any supervision or authority over the superintendent, except that when the authority is divided in this way, a sort of rivalry springs up, which is conducive to the best of results. The stenographers, invoice, and stock clerks, should all be under the chief clerk. When it comes to the cost system, many of you remember the dark hours of the war when the millwork industry appeared before the War Industries Board and was asked what it could do for the country, and the millwork industry had to stand open-mouthed before these men and tell them they did not know. When the same War Industries Board asked for costs, they could not be shown or given. That was deplorable. During the war, fortunately, the word "competition" was left out of the vocabulary of most businesses. Unfortunately, since the armistice the idea of keeping up the morale of your competitor has again subsided. A first-class manager must, above all else, know his competition and handle it on a scientific basis. He must work out a volume of business in his territory, or at least he must estimate it, and then not try to be a hog with it. In other words, he must in word, deed, and fact, mould and keep up his competitor's spirit. That is one of the biggest jobs of a manager.

Annual audits are, of course, in this age of taxation very much employed. There was a time when a bookkeeper very much objected to an audit. In this day and time, if a bookkeeper should object to an audit he should be immediately discharged, just the same as any employee, who is put under bond and objects, should be discharged. Every employee who has any position of trust should always be put under bond; the company, of course, paying the premium.

Sales and Advertising

The sales department should have, above all else, efficient estimators. A concern that does about a million dollars worth of custom-made work during the year will estimate between six or seven million dollars worth of work, and there should be one estimator for every two million dollars' worth of work to be estimated. This has been scientifically arrived at. Then there should be, of course, a competitive sales force. This, naturally, depends upon the territory in which the plant is situated, and ordinarily, the average salesman in the sash and door business should produce between twenty and thirty thousand dollars' worth of direct sales, and account for an equal amount in indirect sales per month. So it is easy to arrive at a figure here as to the amount of business that a concern feels that it can do or wants to do. The jobbing warehouse should be directly under the control of the sales department.

One of the most important duties of the sales department is, of course, the advertising. Now advertising should be intensively done, if done at all. Newspaper advertising in the sash and door business is waste of money. It is only the direct advertising that pays, and, by direct advertising, I mean advertising to contractors, lumber yards and prospective owners, who have indicated a desire to purchase something in the building line. Low prices have never made a sale of building material. A "desire" for them has made sales, and it is only by advertising that a desire can be created. When such a desire is created, then the sales department, in its advertising way, is accomplishing a purpose and that is what you want to arrive at, of course—a purpose. Handsome catalogues, pamphlets and booklets, together with an occasional trinket of some kind, is money intensively invested in the sash and door business. There are, of course, a great many ramifications to this subject. The minutia of detail is tremendous, but the results are also tremendous, if scientifically arrived at. Reports from department heads are absolutely essential; reports that can be made into graphs; reports that can be used for comparison—they are not only desirable, but they are really a pleasure, and any business that is not a pleasure is not worthy of the name.

One of the policies of a first-class company should be to align themselves with trade organizations, or other crafts. Every millwork industry should belong to a national, sectional and local organization. It should subscribe liberally to trade magazines; to business magazines. There are some splendid services to be subscribed for at practically no financial cost, which service, such as the Dartnell Service, is of tremendous value to sales and office forces. Forbes Magazine strikes more at the root of business than any that has come to my attention. It is passing strange that in practically no magazines is there ever an article on the millwork industry. When systems are asked for from any service that business writers or magazines solocit,

the millwork industry seems to be beyond the pale. There must be an answer for that, and it seems that the answer is that real systems have seldom been tried in the millwork industry. In the course of the next few years, however, great strides will have been made in the right direction. Most magazines now carry millwork advertising, and there is only one up-to-date national advertised lumber concern.

It is therefore with fitting interest that I call upon you to go to work. Go to work is a scientific way; study your problems in a dollars and cents way, if you please, but before all else, remember that there is a better way to do everything, and if you run your business in a co-operative and co-ordinative spirit, together with the gentility and suavity to do as you have naturally fallen heir to—the pendulum will swing back the other way and we will again come into our own.

Foreman Relation to Modern Industry

Should Strive to Retain Good Will and Respect of all Employees — Taking an Interest in Their Welfare and Home Life Creates Feeling of Friendliness and Confidence — Has Difficult but Extremely Important Position to Fill

By R. J. WALDO

(Continued from August issue)

After a most careful and exhaustive study of foremen, including the most successful in the field, I have made the following notes as to what makes a successful foreman. It is quite improbable that each and all will be found in every foreman, however, they are the fundamental elements which make for a successful department head.

No foreman will succeed for his employer who does not treat his men as he wants them to treat him. This practice of the golden rule is, I consider, most important of all. It is the one drawstring which enables the department head to get maximum production from his men and hold for his employer the practical, desirable men.

Favoritism Must Be Taboo

No foreman can succeed who plays favorites with his men. If there is anything a worker detests more than a favorite among his fellow-workers it is a foreman who plays favorites. The desirable employee and the employee who proves the most efficient is the one who wants to be recognized by his ability and not be favored because the foreman takes a liking to him or a dislike for others. There are times when a foreman is admired by workers because he shows a favor to some workmen, however, these times are when some employee is sick and unable to work. If the worker has a family dependent upon him this sort of a favor is appreciated by the fellow-workers of the employee who is in such unfortunate straits. By showing this sort of respect the foreman wins the good-will of his men and in turn his employer.

In shops where team-work is found the foreman must be a man demanding a fair deal among the workers as well as the fair deal toward the company. He must be man enough to speak up to his superiors when they issue an order which will render hardship upon his workers. Many a foreman has lost the respect of his workers because he would not speak against an order which he knew full well would work a hardship upon those under him. He should be able to distinguish between the company's rights as an employer as well as the workers' rights as a wage earner and be willing and ever ready to make suggestions which will rectify any mistakes which may be made by his superiors.

The foreman who is always criticizing the bad work his men do without a word about the good work done is in the wrong. No man desires to hear criticism continually about the work he has spoiled when he spoils very little and that possible because of some fault of the machine. The foreman who criticizes his men for poor workmanship when the machine is at fault will never gain the full co-operation of his men. This has been proved. Foremen must be able to distinguish when the machine is at fault and when the man is at fault. During the war I knew personally one foreman who tried to know every time an especially good lot passed through and was very prompt in recognizing the good work to the man who did it. He never had the record of scrap in his department that was found in some of the other departments of the same organization.

When passing through a plant one afternoon I happened to stop by the inspection table. The inspector had called the foreman and told him that there were three pieces that were not filed down as much as they should have been. The foreman did not return the pieces to the worker, but took a file and corrected them himself, saying that the man that had filed them down at first was busy on another lot and he could do them quicker than they could be returned to the man. After the foreman returned he said nothing to the man about it for several days, when he mentioned it to him casually and in no manner of criticism. He realized that an occasional mistake was being made by the men and during the rush which was being experienced he was prepared for them. Such foremen do not have such a high labor turnover and have always a waiting list from the plant of men who want to wor kin the department.

Interested in Advancement of Employee

Later when in the tool designing department I found that a special tool was being designed for one of the machines. This I understood to mean that the machine which had been idle for some time was to be put back into use again. The next time I saw the foreman I asked him if he wanted a new man for the machine He promptly informed me that he was going to put Young on it. He felt that he should do so, as it would mean more money for Young and he had proved so efficient upon the bench that he said he would rather do it. Young was put on the machine and curiously enough the foreman stayed wit hhim for two days to be certain that he understood thoroughly the machine before he left him. During the entire time that Young was being trained no rejected pieces was allowed to

be returned to him by the inspection department. This foreman made the part right and in a very pleasing and satisfactory manner corrected the mistake with the operator without him ever knowing that a mistake had been the cause of the foreman stopping to point out the error.

The foreman in event of a grievance should always be willing to hear the entire story from both employees before making any decision in the case. In former times a foreman heard the first story and decided that his favorite workman was right. However, those days have passed and now in place of them we find the foreman who is willing to hear both sides before making any decision.

I was standing upon a street corner one afternoon when two other men were standing near. They were talking about a sick child of the older man. Soon another man came along and promptly asked, "How is the kiddie, Jack?" The older man promptly responded, "Getting along first rate, Buck." The latter man then added, "Gladto hear it," then went on. It was a simply worded inquiry. Yet I understood from the conversation between the two men that it was his foreman. This sort of a foreman, who is interested enough in his workers affairs to make inquiry when out of work, is the man who is admired by his men.

Must Have Broad Outlook

I have been informed by a superintendent that he has a foreman who takes particular pains to keep close check upon what his workers are doing while away from the plant. In one instance the foreman stepped into the superintendent's office and asked for a raise for one of his men. The superintendent asked upon what grounds the man was asking for the raise, and was promptly informed that the man had not asked for it, but he knew he was starting to buy his home and knew that the raise would come in handy and in turn make him thoroughly appreciative of the raise. The raise was promptly granted.

Another foreman knows personally the district representative for one of the largest correspondence schools, nad whenever a man from his department makes an inquiry he always keeps posted as to whether or not the worker took the course or not, and if not, why not. When he sees a man taking a coarse he watches, and as soon as he sees an improvement he always puts in a raise before being asked. He also keeps a close check upon the worker to be certain that he does not drop it because of financial difficulties.

Again let mes ay that the foreman who makes a mistake in giving an order should be willing to shoulder the blame every time. I have seen foremen argue that they gave the order right and that the man was wrong. This draws contempt of his workers more than anything that I know of. It in timed estroys the moral of the department.

The foreman's job is beginning to be one of the important jobs of industry, and unless the men holding these places are willing to shoulder their part and be willing to do the things that will make for greater reospnsibility and efficiency of their department, then they beter step down and let some one take the place who will. Industry to-day is demanding broad-minded men for these places, and as soon as men are demanded they usually appear. However, if men wish to hold their places they must keep abreast with the times and advance as fast as the industrial world or they will awaken some day to find another man in their place.

Is Cooperage Industry on Retrograde?

In an effort to arouse the interest of its members and to increase the active membership of the organization of the nation the Association of Cooperage Manufacturers recently addressed a letter to present and prospective members from which the following startling queries and statements were taken. If the situation is anything like as serious as pictured it behooves every person interested in this important industry to assume the aggressive, and not only strive to regain lost ground, bnt to win new fields and new markets for barrels and cooperage stock. Regardless of how satisfactory or how serious the present situation may be or how little the industry is effected by the competition of rival containers, it is always a good, sound business policy to be constantly on the alert and ever on the aggressive:

Is the scythe of business Death starting its swing in the cooperage industry? Why?

Is it accident that the flour business is practically lost to cooperage?

Is it just "chance" that the sugar business is swinging to other packages?

Is it merely "general business conditions" that has crowded cooperage out of the cement field?

Whose fault is it that cooperage to-day has its back to the wall in the fruit trade?

What condition made possible the increasing use of steel barrels and drums?

While all this slipping and sliding has been going on has anyone in the cooperage business tried to check it?

Why is cooperage to-day a shrinking, dwindling industry—when ever flour men, cement men, sugar men and fruit men freely admit the splendid service value of the barrel?

The true answer to most of these questions may be summed up in the statement that, while many producers of cooperage are not even fairly keen on the manufacturing end, they have not as a class progressed much beyond the kindergarten stage when it comes to marketing that product.

This goes far beyond any question of price.

It means an understanding of the uses to which their product will be put; the service which such uses demand; the problems involved in the best handling of various products to their final users; the need for and adaptability to special purposes. Nothing, short of this, will save cooperage—or any other industry.

The record shows, however, that manufacturers have persistently and almost wilfully disregarded these vital elements.

Too many have been busy turning out rotten stock—afraid to face honest inspection—trying to skin out a little passing profit on an unknown basis of cost and an undreamed of basis of market needs.

All civilized countries require every man who would practice law or medicine to pass rigid examinations after long and arduous study before he is permitted to practice his profession.

Maybe sometime, reputable business will be protected from the suicidal tactics of the man who, because he can borrow some capital, embarks heedlessly upon some line of business that "looks good."

With persistent blindness to facts, in the face of earnest and continued efforts to bring about better conditions, the industry as a whole has ignored the growing evidences of a decline.

In the fact of strong, intelligent and persistent com-

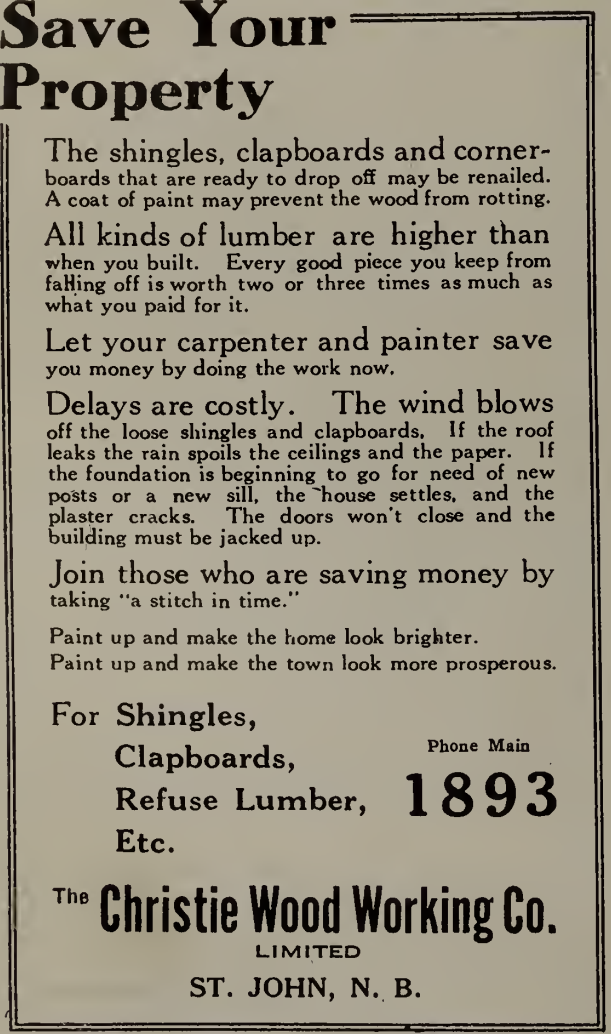
petition, it has held an attitude of indifference—and now comes the reckoning.

And to-day we find the cooperage industry headed straight for the rocks—and no amount of procrastination, refusal to face facts nor old-time tactics can save it. And it is almost too much to hope that the policies which have brought it there can be changed over night.

The "squeeze" is on. The competition of other containers of quality, adaptability to user's needs and backed by strong salesmanship is exerting its relentless pressure.

Co-operative Advertising

A number of progressive concerns in St. John, N.B., have been doing considerable co-operative advertising. Included among these firms are paint and hardware merchants and a number of woodworkers. The idea is that what benefits one usually means a little business for the other. Thus if people can be persuaded to repair their buildings, it means a sale of paint, while on the other hand if they can be persuaded to paint up, it often means a sale of lumber or building material for repair purposes. In this way the woodworking plants and merchants both stand to secure a share of all business accruing.



Type of Envelope Stuffer Used

Early in the season a newspaper advertising campaign was conducted along the line of Repair Up and Paint Up, and it is the opinion of those concerned that the large number of houses in St. John which have been repaired and painted this year, is due in no small degree to the publicity carried on.

At the present time they have prepared a large number of circulars for use as envelope stuffers, as shown in the accompanying illustration. While the expense of these stuffers is shared by those entering into the scheme, yet the advertising each firm sends out bears its own name. This is a very inexpensive form of advertising yet it is very efficient and in this particular instance is showing results.

The idea of co-operative advertising is a good one and could well be adopted by similar concerns in other cities. It is commonly believed that the revival of business rests largely with the building industry. Advertising of this kind offers one way of stimulating building and helping along the much heralded trade revival.

Among those taking part in this campaign are:—The Christie Woodworking Co., Limited, and Haley Bros. & Co., both of St. John, N.B.

The Distribution of Wealth

It would greatly simplify the industrial and social problem if everybody would grasp the fact that the great function and purpose of all legitimate business is to supply the needs and wants of the population, and that the aims of business should be to increase constantly the supply. The effort should be to meet the constantly expanding wants of the people. There is no limit to them. There is no danger of overproduction, so long as production is kept in balance, so that everybody has something to offe rin the exchange that is in demand. Every class and group in the population is interested in increasing production, so that the standard of living may be constantly raised.

When this general function of business is understood, and all classes concentrate upon it, the test of every policy will be the effect it has on production. It will soon be discovered then that there is no other employment for capital except in production for the public market and in distribution thereupon, and, therefore, that accumulations of capital are beneficial to the entire community, no matter who owns them.

A Convenient Humidity Table for the Wet and Dry Bulb Hygrometer

Users of wet and dry bulb hygrometers will find the following table, compiled at the Forest Products Laboratory, Madison, Wisconsin, very useful for quickly determining relative humidity values from wet and dry bulb thermometer readings. To use the table, read the temperatures and subtract the met bulb reading from the dry. Locate the vertical column of figures headed by the appropriate difference between wet and dry bulb readings, and the horizontal row of figures beginning at the extreme left with the observed dry bulb reading. The figure marking the intersection of these rows is the relative humidity value expressed in per cent.

Take the following as an example: Wet bulb temperature 13 2degrees Fahrenheit; dry bulb temperature 140 degrees; difference 8 degrees. The figure marking the intersection of the vertical column for 8 degrees difference with the horizontal row beginning with 140 at the extreme left is 79, which is the correct relative humidity for the given thermometer readings.

Relative Humidity Table

Difference between wet and dry bulb thermometers in degrees Fahrenheit.

Temperature of Dry Bulb.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
60	94	89	83	78	73	68	63	58	53	48	44	39	34	30																										
70	95	90	85	81	76	72	68	64	59	56	51	47	43	40	37	33	29																							
80	95	91	87	83	79	75	71	68	64	61	57	54	50	47	44	41	38	35	32	29																				
90	96	92	88	85	81	77	74	71	67	65	61	58	55	52	49	47	44	41	39	36	34	31	29	26	25															
100	96	93	89	86	83	79	76	73	70	68	64	62	59	57	54	51	48	46	44	42	39	37	35	33	31	29	27													
102	96	93	89	86	83	80	77	74	71	69	65	62	59	57	54	52	49	47	45	43	40	38	36	34	32	30	28													
104	96	93	90	86	83	80	77	74	71	69	65	63	60	58	55	52	50	48	46	43	41	39	37	35	33	31	29	27												
106	96	93	90	87	83	80	77	74	72	69	66	63	60	58	56	53	51	48	46	44	42	40	38	36	34	33	31	29	28											
108	96	93	90	87	84	81	78	75	72	70	66	64	61	59	56	54	51	49	47	45	43	41	39	37	35	33	31	29	28	27										
110	96	93	90	87	84	81	78	75	72	70	67	64	62	60	57	55	52	50	48	46	44	41	39	37	36	34	32	30	28	27										
112	96	93	90	87	84	81	78	75	73	70	67	65	62	60	57	55	53	51	49	47	44	42	40	38	37	35	33	31	29	28										
114	97	93	90	87	84	81	78	75	73	71	68	65	63	61	58	56	53	51	49	47	45	43	41	39	37	35	34	32	30	28	27									
116	97	93	90	88	84	82	79	76	74	71	68	66	63	61	59	56	54	52	50	48	46	44	42	40	38	36	34	33	31	29	28									
118	97	93	91	88	85	82	79	76	74	71	68	66	64	62	59	57	54	53	51	49	46	44	42	41	39	37	35	34	32	30	29	27								
120	97	94	91	88	85	82	79	77	74	72	69	66	64	62	60	57	55	53	51	49	47	45	43	41	40	38	36	34	33	31	30	28	27							
122	97	94	91	88	85	82	79	77	75	72	69	67	65	63	60	58	56	54	52	50	48	46	44	43	41	39	37	36	34	33	31	29	28	27						
124	97	94	91	88	85	83	80	77	75	72	70	67	65	63	61	58	56	54	52	51	48	46	44	43	42	40	38	37	35	33	32	30	29	28						
126	97	94	91	88	86	83	80	78	75	73	70	68	65	64	61	59	57	55	53	51	49	47	45	43	42	40	38	37	35	33	32	31	30	28	27					
128	97	94	91	89	86	83	80	78	76	73	71	68	66	64	61	59	57	55	53	52	49	47	46	44	42	40	39	37	36	34	33	31	30	28	27					
130	97	94	91	89	86	83	80	78	76	73	71	68	66	64	62	60	58	56	54	52	50	48	46	44	43	41	40	38	36	35	33	32	30	29	28					
132	97	94	92	89	86	83	81	78	76	74	71	69	67	65	62	60	58	56	54	53	50	49	47	45	43	42	40	39	37	35	34	32	31	30	29	27				
134	97	94	92	89	86	84	81	79	76	74	71	69	67	65	63	61	59	57	55	53	51	49	47	46	44	42	41	39	38	36	35	33	31	31	29	28				
136	97	94	92	89	86	84	81	79	77	74	72	69	67	65	63	61	59	57	55	53	51	50	48	46	45	43	41	40	38	37	35	34	32	31	30	28	27			
138	97	94	92	89	86	84	81	79	77	74	72	70	68	66	63	62	60	58	56	54	52	50	48	47	45	43	42	40	39	37	36	35	33	32	31	29	28	27		
140	97	94	92	89	87	84	81	79	77	75	72	70	68	66	64	62	60	58	56	54	52	51	49	47	46	44	42	41	39	38	36	35	33	32	31	29	28	27		
142	97	94	92	89	87	84	82	80	77	75	73	70	68	66	64	62	60	58	57	55	53	51	49	48	46	44	43	42	40	39	37	36	34	33	32	30	29	28	27	
144	97	95	92	89	87	84	82	80	78	75	73	71	69	67	65	63	61	59	57	55	53	52	50	48	47	45	44	42	41	39	38	36	35	34	32	31	30	29	27	
146	97	95	92	90	87	85	82	80	78	75	73	71	69	67	65	63	61	59	57	56	54	52	50	49	47	45	44	43	41	40	38	37	36	35	33	32	31	30	28	27
148	97	95	92	90	87	85	82	80	78	76	73	71	69	67	65	63	61	60	58	56	54	53	51	49	48	46	45	43	42	40	39	38	36	35	34	32	31	30	28	28
150	98	95	92	90	87	85	82	80	78	76	74	72	70	68	66	64	62	60	58	57	55	53	51	49	48	46	45	43	42	41	39	38	37	36	34	33	31	30	29	28
152	98	95	93	90	88	85	83	81	79	76	74	72	70	68	66	64	62	60	59	57	55	53	52	50	48	47	46	44	42	41	40	39	37	36	35	33	32	31	30	29
154	98	95	93	90	88	85	83	81	79	77	74	72	70	68	66	65	63	61	59	57	56	54	52	50	49	47	46	44	43	42	40	39	38	37	35	34	33	32	31	30
156	98	95	93	90	88	85	83	81	79	77	74	72	71	69	67	65	63	61	59	58	56	54	53	51	49	48	46	45	43	42	41	40	38	37	36	34	33	32	31	30
158	98	95	93	90	88	86	83	81	79	77	75	73	71	69	67	65	63	61	60	58	56	55	53	51	50	48	47	45	44	43	41	40	39	38	36	35	34	33	31	30
160	98	95	93	90	88	86	83	81	79	77	75	73	71	69	67	65	64	62	60	58	57	55	53	52	50	49	47	46	44	43	42	41	39	38	37	35	34	33	32	31
162	98	95	93	90	88	86	84	82	80	77	75	73	71	69	68	66	64	62	60	59	57	55	54	52	51	49	47	46	45	44	42	41	40	39	37	36	35	34	32	31
164	98	95	93	91	88	86	84	82	80	78	75	73	72	70	68	66	64	62	61	59	58	56	54	52	51	49	48	47	45	44	43	42	41	39	38	37	36	35	33	32
166	98	95	93	91	88	86	84	82	80	78	76	74	72	70	68	66	65	63	61	59	58	56	54	53	51	50	48	47	46	44	43	42	41	39	38	37	36	35	34	33
168	98	95	93	91	88	86	84	82	80	78	76	74	72	70	68	67	65	63	61	60	58	56	55	53	52	50	49	47	46	45	43	42	41	40	39	37	36	35	34	33
170	98	95	93	91	89	86	84	82	80	78	76	74	72	70	69	67	65	63	62	60	59	57	55	53	52	51	49	48	47	45	44	43	41	40	39	38	37	35	34	33
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174	98	95	93	91	89	87	84	83	81	78	76	75	73	71	69	67	66	64	62	61	59	57	56	54	53	51	50	49	47	46	45	43	42	41	40	39	37	36	35	34
176	98	96	94	91	89	87	85	83	81	79	77	75	73	71	70	68	66	64	63	61	60	58	56	55	53	52	50	49	48	46	45	44	43	42	40	39	38	37	36	35
178	98	96	94	91	89	87	85	83	81	79	77	75	73	72	70	68	66	64	63	61	60	58	56	55	54	52	51	49	48	47	46	44	43	42	41	39	38	37	36	35
180	98	96	94	91	89	87	85	83	81	79	77	75	73	72	70	68	67	65	63	62	60	58	57	55	54	52	51	50	48	47	46	45	43	42	41	40	39	38	36	35
182	98	96	94	91	89	87	85	83	81	79	77	75	74	72	70	68	67	65	63	62	60	59	57	56	54	53	51	50	49	48	46	45	44	43	42	40	39	38	37	36
184	98	96	94	92	89	87	85	83	82	79	77	76	74	72	70	69	67	65	64	62	61	59	57	56	55	53	52	50	49	48	47	45	44	43	42	41	39	38	37	36
186	98	96	94	92	90	87	85	83	82	80	78	76	74	72	71	69	67	66	64	62	61	59	58	56	55	53	52	51	49	48	47	46	44	43	42	41	40	39	38	37
188	98	96	94	92	90	87	85	84	82	80	78	76	74	73	71	69	68	66	64	63	62	59	58	57	55	54	52	51	50	49	47	46	45	44	43	41	40	39	38	37
190	98	96	94	92	90	88	85	84	82	80	78	76	75	73	71	69	68	66	65	63	62	60	58	57	56	54	53	51	50	49	48	46	45	44	43	42	41	40	38	37
200	98	96	94	92	90	88	86	84	82	80	79	77	75	74	72	70	69	67	66	64	63	61	60	58	57	55	54	53	52	51	49	48	47	46	45	43	42	41	40	39

Find difference between wet and dry bulb readings, then follow the row which corresponds to dry reading to column headed by difference in temperatures and the figure at the intersection will be relative humidity, expressed in per cent.

Interesting views taken at plant of Radford-Wright-Wilson Co., Limited, Winnipeg, Manitoba

General view of factory and warehouse Radford-Right-Wilson Co., Limited, Winnipeg, Man.

Modern Woodworking Industry in Manitoba

Has Built Up Large Business in Last Few Years — Plant and Equipment Modern in Every Respect — Giving More Attention to High Class Work

By E. H. CHAPMAN, Winnipeg, Man.

That all the progressive, up-to-date woodworking plants are not confined to Eastern Canada or the Pacific Coast section may be gathered from the accompanying views of the industry of Radford-Wright-Wilson Co., Limited, Winnipeg, Man. This firm started in a small way a few years ago, but has grown and expanded until to-day it is numbered among the largest woodworking concerns in the prairie provinces, if not in the whole of Canada. A glance at the illustration, showing a general view of the factory, storage buildings and yards, will give an idea of the size and completeness of the present unit. The addition shown on the left has been but recently been completed.

This business was founded in 1910 by W. F. Radford, who equipped a small sash and door factory. A disastrous fire, in which the plant was burned to the ground, occurred shortly after it was put in operation The fire proved to be of incendiary origin, having been set by a fire bug who was responsible for about twenty-five fires. The plan of this monomaniac was to start a fire, turn in an alarm and then assist the firemen in their efforts to extinguish the blaze. He was eventually captured and judged insane.

Have Developed an Efficient Plant

In spite of this set-back, the firm never faltered, but immediately commenced the construction of a new and larger plant on the site on which the present industry stands. This has been expanded and extended many times since 1910, but the efficiency of the factory and the comfort and convenience of the workmen has never been lost sight of. The pictures taken in and around the plant show a modern, well-lighted structure, with fire-breaks, fire-walls and an automatic sprinkler system to lessen the fire risk. The machinery is not crowded, as there is plenty of floor space allotted to each piece of equipment, tending for maximum production, also for the comfort and safety of the mechanics. A shavings exhaust system takes care of the lighter refuse, further adding to the comfort of the employees.

The first illustration shows a scene in the planing mill. This battery of stickers is kept steadily at work on mouldings, sheathing, special detail work, etc. Overhead among the exhaust system pipes can be seen a horizontal steam radiator. This ensures a more even distribution of the heat than if wall pipes or radiators had been used exclusively.

The second view shows a section of the cabinet-making department. An immense variety of work is handled here, including the regular line of millwork and special high-class woodwork jobs of all kinds. Here again it will be noticed that there is an abundance of light. A glimpse of the glue room may be had through the open doors.

Work Kept in Orderly Manner

The third picture depicts the operation of panel-raising. It also shows how the work in progress is stacked in neat, orderly piles. This is a noticeable feature of the whole plant and suggests efficient and careful supervision.

The fourth view was taken in the door department. The machine in question is a double end tenoner with chain feed, and as a rule is found only in plants where high production is sought. The fire-breaks mentioned previously can be noticed in this illustration. These are dropped down from the ceiling and extend the full width of the building. In the event of fire, they tend to retard the rapid spread of the blaze by preventing the blaze from running along under the roof.

The fifth photograph shows the dry kilns and some of the raw material. It will be noticed that the lumber is piled on kiln trucks so that it may be placed in the kiln without rehandling.

The last picture, No. 6, was taken in the sash department, and shows a fast feed sash sticker. In several of these views it will be noticed that the main shavings exhaust pipes are under the floor and that the auxiliary feeds are carried over and down.

When working to capacity the output consists of three hundred doors and six hundred windows each day, in addition to an immense quantity of frames and

general woodwork. While the plant was designed primarily for the production of sash, doors and millwork, in recent years they have gone after the very best jobs and have turned out special orders that compare favorably with anything produced on the continent.

About one hundred men are employed in the factory, and, as suggested before, nothing is left undone that would add to their comfort or convenience or that would tend to make them better satisfied with factory conditions. Lockers and other facilities have been provided, and to add to the cheerfulness of the plant, the walls are kept white and clean.

The electric drive is used throughout the plant, power being secured from the city of Winnipeg. The steam plant is used to provide heat for the kiln and factory.

The personnel of the company is as follows: W. T. Wright, president; Donald H. Radford, vice-president; James A. Wilson, secretary-treasurer and general manager, and C. W. Radford and F. W. Radford, directors The Radford family are pioneers in the woodworking field, as the last three generations have been engaged in this line. Under the able management of the above officials and directors, this industry has become a big factor in the woodworking field in Western Canada.

Interesting Machinery Displays at C. N. E.

Several New Machines Included in Exhibits — More Room and better Facilities Required —Machinery Hall Proved Centre of Interest

Whiel the quality of the displays at the Canadian National Exhibition was maintained at the usual high level, the number of machinery manufacturers and dealers making exhibits showed a marked decline. This was due to the fact that the building and facilities provided for displaying machinery and equipments are entirely inadequate. One can picture the interest aroused by a display of woodworking machines set up and in operation. Judging from the questions asked, the general public is in need of some education in this respect. As an example, one visitor happened to see a piece of moulding lying on the bed of a nailing machine, and asked if that was the machine in which such moulding was made. If proper space and facilities were available, the manufacturers of woodworking equipment would be only too glad to set up their newest and best creations and put them through their paces.

Displays of woodworking equipment serve a double purpose, in fact they serve many purposes. They enable the manufacturer to exhibit and explain his line and they provide an opportunity for the woodworker to keep fully informed as to all the new developments in the line of machinery and accessories. It is interesting to watch a practical woodworker approach a booth and see his eye brighten when he sees something new in his line. It does not take him long to size up the machine, note its weak and strong features and also make a mental note of where it could be used to advantage in his own plant.

Anyone interested in practical mechanics would have been amply repaid for a visit to "Machinery Hall." Among the exhibits of particular interest to woodworkers were the following:—

P. B. Yates Machine Co., Limited. The display of the P. B. Yates Machinery Co. was made in their usual location and consisted of a number of their woodworking machines. Probably the feature of the exhibit was the new No. 830 nailing machine. This machine was set up and in operation and was always a centre of attraction. In addition to the nailer, a G 2, straight edging and jointing saw, a No. 156, ball bearing single surfacer and a S 2, edge sander comprised the heavy machines, while a "Black Diamond" combination circular and band saw filer and setter and a "Black Diamond" band saw filer completed the machinery display. The G 2 straight edging and jointing saw was fitted with ball bearings. This is a new departure in the construction of this machine. Another feature was a flexible coupling between the drive pulley and the saw mandrel. This coupling serves two purposes. One is that it takes up all belt vibration which would otherwise be transmitted to the saw, and in addition it provides an easy means of attaching a motor if a direct-connected electric drive is preferred.

A. R. Williams Machinery Co., Limited. This firm made their usual comprehensive display of wood and iron-working equipment. The woodworking end of the exhibit was taken care of by three C.M.C. saws. Two of these are new machines, one the No. 613, light ripping and jointing saw, being a lighter edition of the well-known 611 straight edging and jointing saw, and the other No. 605 improved self-feed rip saw. embodies many new and improved features, some of which are being covered by patents. The third machine was a No. 617 variety saw. Included among the iron-working equipment was a number of engine lathes, together with milling machines, shapers, grinders and the equipment of a similar nature. A number of small tools and accessories, including some precision equipment, completed the exhibit.

Garlock-Walker Machinery Co., Limited. Instead of taking place in the Machinery Hall, as has been their custom in the past the Garlock-Walker Machinery Co., Limited, of Toronto, made their display in their machinery warehouse on Dufferin St. As this warehouse is situated just outside the main entrance to the grounds, they thought that they were in a favorable position to receive their many friends, as well as to attract new ones. Not only that but by making a display in this manner they weer in a position to show their entire stock of new and used woodworking and iron-working machines. Just inside the entrance to their warehouse they were showing a number of "American woodworking machines, including a No. 30, universal rip and cut-off saw, American No. 25 straight edging and jointing saw, American No. 3, double cut-off saw, with power adjustment, and an American power feed jointer and a disc and spindle sander. In addition almost any machine one would wish to see was on the floor.

Elliott Machinery Co., Limited. As usual the display of the Elliott Machinery Co., Belleville, Ont., was a centre of attraction. Their combination woodworking machine, together with the supplementary equipment, such as small pony planer, jig saw, drum sander and band saw attracted widespread attention. The construction of the Elliott combination woodworker is

such that two men may operate different parts of the machine at the same time. It is designed for such operations as ripping, cross-cutting, mitering, gaining, dadoing, jointing, bording and many other operations in an efficient manner. The construction is such that it can be driven either by electric or gasoline power. The interest in this display was increased by the fact that most of the machines were in operation. It if were possible for the manufacturers of woodworking equipment to set up and operate a representative display of their line, it would make an educational feature that would tend to arouse greater interest in woodworking equipment and wood products.

Cowan & Co. of Galt, Limited. This firm was not able to secure their usual space, but at the last moment a half section was offered them. As this space was limited, they found it impractical to make a very imposing display. They were showing their No. 319 belt sander, Cowan hollow chisel mortiser and a Cowan jig saw. Supplies, in the shape of moulder knives, saws, cutter heads, mortise chains and the Cowan round safety cylinder head, were also displayed. A representative of the Concord Piano & Player Piano Co., Melbourne, Australia, evinced considerable interest in the Cowan line, and before leaving he placed a good order for equipment for the new factory his firm are erecting at Melbourne.

Chapman Double Ball Bearing Co., Limited. A convincing demonstration of the low friction co-efficient of ball bearings for transmission purposes was staged in the exhibit of the Chapman Double Ball Bearing Co., Limited, Toronto, at the Canadian National Exhibition. Nineteen ball bearings and a number of short lengths of heavy shafting, together with pulley and fly wheels, one of the latter of which weighed in the neighborhood of 500 lbs., were all in operation, the power being furnished by a 1/20 h.p. motor, using a string drive. This load would be equal to about 200 feet of 3" shafting with the necessary hangers and bearings. Needless to say this demonstration aroused a lot of interest, and many favorable comments were made, not only as to the originality of the demonstration but as to the almost frictionless operation of the bearings. Other articles on display included the Chapman ball bearing lift-truck and ball and roller bearings for Ford and Chevrolet cars. Mr. Murray and Mr. Hawkin were in charge of the exhibit.

D. K. McLaren, Limited. The belting shown by D. K. McLaren of Montreal, in their stand at the Canadian National Exhibition made up a very attractive exhibit. Samples and rolls of the various kinds of belting, such as oak tan leather, Balata and cotton, were displayed in a very attractive manner. Other supplies on exhibition included various kinds of lacing, Phillips steel pulleys, wood pulleys and mill supplies of different kinds.

The International Business Machines, Limited. The wide range of time-recording and time-keeping clocks and other special machines for tabulating, sorting and assisting in keeping track of office details manufactured by the International Business Machines, Limited, Toronto, could be gathered from their exhibit in the Process Building.

The time-recording and time-keeping clocks included a full line of automatic and semi-automatic instruments. The automatic clock changes at specified times from "in" to "out," also from shift to shift. A door time clock was being demonstrated which made a record of each time the door was opened. Each employee would possess a key which when inserted in the lock would cause that employee's number to be recorded, together with the time they opened the door. In this way a complete check could be kept on each person, not only with regard to punctuality but also covering any periods during which they might be absent from the office.

Mechanical Leathers, Limited, Toronto. A very interesting assortment of leather products was on display at the Canadian National Exhibition in the booth of Mechanical Leathers, Limited, Toronto. The showing included their well-known Chicago rawhide belting, vulcanite krome belting, hi-grade oak belting, fabri-krome belting and round and twist machine belting. These were shown in various widths. The fabri-krome belting is a combination product having a fabric back cemented and stitched to a chrome leather facing. This produces a medium-priced belt having the strength and power delivering properties of chrome belting. Other leather products shown included rawhide gears, pinions, hammers, mallets, lacing and gear blanks. Also in chrome leather was displayed cups for pumps, valves, washers, gaskets, clutch faces, chrome laces and other articles of a similar nature. Another interesting exhibit was an imitation leather, having a face coating made of a leather product. In appearance this could not be distinguished from real leather and it had the flexibility of the genuine article as well. In this respect it differed from the ordinary imitations which are inclined to crack when creased.

Woodwork Exhibits Arouse Interest

That the public are interested in woodwork and building material was clearly demonstrated by the many inquiries made at the booths of the Laidlaw Lumber Company and the Buyer's Door & Manufacturing Co. These two displays consisted of a wide range of inside and outside doors, newel posts, turned columns, samples of grill and colonade work and other items in high-class woodwork. Many of the inquiries came from people who contemplated building and will, if followed up, likely result in a considerable volume of business being booked. The Canadian National Exhibition offers an opportunity for firms, manufacturing woodwork of all kinds, to arouse more interest in their product. By displaying high-class woodwork in an attractive setting they would be enabled to mould the tastes of the general public, to educate them to the value of fine work and thus increase the demand for better woodwork.

Technical School Makes Display

The practical value of the training given at the Central Technical School, Toronto, could be gathered from the showing made by the pupils of the different classes. In the woodworking line a range of articles including chairs, tables, wardrobes, grandfather's clock, tea waggons and numerous other pieces were shown. When it is borne in mind that these pieces were designed, worked out and finished by the pupils and that in producing these articles they were called upon to make their own drawings, lay off a "rod" and take off a stock bill, it will be seen that the training given covers woodworking in a very thorough manner.

The business man without understanding, without knowledge, belief, sense or reason is at the mercy of every one, including his customers and competitors. He knows not when or where to start nor when or where to stop. He bats about blindfolded, unarmed, in the dark.

Prime Costs in Box Industry

Items which Must be Considered Before True Lumber Cost at Plant Can Be Reached—Storage and Handling Waste No Small Factor

Ascertaining the cost of lumber delivered at planer or saw is not so simple a matter as it may seem. There are a number of important points which must be taken into consideration before a true delivered cost can be calculated. A glance at the following prime cost factors will give an indication of how complicated this phase of box costing is:

Item 1. Lumber replacement value—Note 1.

Item 2. Yard rental or interest on lumber yard land investment—Note 2.

Item 3. Insurance cost on lumber in yard—Note 3.

Item 4. Taxes on lumber holdings—Note 4.

Item 5. Taxes on yard valuation—Note 5.

Item 6. Interest on money invested in lumber—Note 6.

Item 7. Yard labor, including yard teaming costs—Note 7.

Item 8. Total overhead costs—Note 8.

Item 9. Cost of rough lumber to planer—Note 9.

Item 10. Percentage of waste due to manufacture—Note 10.

Item 11. Cost of lumber in 1,000 ft. finished shooks.

Note 1. This figure to represent replacement value of lumber used, before the addition of yard overhead expense and waste.

Note 2. Example: If lumber yard land be owned by box factory, and valued at $2,000, the interest on investment at current rate (6 per cent.) should be considered. ($2,000 at 6 per cent. is $120 per year.) Assuming the average annual amount of lumber handled through yard to be 5,000,000 ft., the charge would be $0.024 on each 1,000 ft. ($120 divided by 5 000 M).

Example: If lumber yard land be rented, the annual rental being $200, the amount of lumber handled being the same (5,000,000 ft.), the charge would be $.04 on each 1,000 ft. ($200 divided by 5 000 M).

Example: If the greater part of incoming lumber be unloaded direct from cars into the mill without passing through lumber yard, the total yard and unloading expense should be proportioned over entire amount of lumber used. Taking the figure of $120 in the first example. The yard storage being but 750,000 ft., the lumber used in mill 5,000,000 ft. (4,250 000 ft. going direct from cars to mill) the expense per M ft. would be the same $.024 per M.

Note: Item 2 should also include interest on money invested in lumber sheds and lumber yard equipment.

Note 3. Example: Lumber in yard 750,000 ft., value $38 per M. Total value for insurance purposes $28,500. Insurance cost at 1½ per cent., $427.50. Annual cut of lumber in box factory 5,000,000 ft. Insurance cost per M $.0855.

Note: Item 3 should also include insurance on lumber sheds and lumber yard investment.

Note 4. Example: Lumber value for tax purposes $25 to $30 per M. Take average of $27.50. Lumber in yard 750,000 ft. Tax value $20,625. Tax rate from $22 to $27.50. Take an average of $25 on each $1,000, cost of annual taxes $515.62. Annual movement of lumber through mill 5,000,000 ft. Tax cost per M $.103.

Note: Lumber purchased but not delivered upon which taxes accrue should be included in this item.

Note 5. Tax rate same as shown in Note 4 (average about $25 on each $1,000). Lumber yard value $2,000. Annual taxes $50. Lumber through mill 5,000,000 ft. Tax cost per M $.01.

Note: In this item should be included tax on lumber sheds and yard equipment.

Note 6. Average (bank) interest charge 7 per cent., but as it be necessary to carry a bank balance of from 10 per cent. to 20 per cent. of the amount borrowed it brings the actual interest cost up to 8 per cent. or more. Value lumber in yard (750,000 ft.) $28,500. Interest at 8 per cent., $2,280. Annual lumber used 5,000,000 ft. Interest cost per M $.456.

Note: Interest on money invested in lumber but not delivered should be included in this item.

Note 7. Example: All yard labor (unloaders, stackers, surveyors, teamsters, teams, trucks and truck drivers) expense should be included in this item. If this charge varies in different seasons, cost average should be taken once a week or at least every 30 days.

1 Surveyor at	$ 28.00
4 Lumber handlers at $26	104.00
1 Teamster at	25.00
1 Team at	36.00
Yard cost per week	$193.00
Yard cost per day	$ 32.17
Yard cost per month (26 days)	836.40

Monthly lumber turn over 416,000 ft. (5 000,000 ft. per year) yard labor cost per M $2.01.

Note 8. In this item show total of all costs itemized, items 2 to 6 inclusive.

Note 9. Add item 8 to item 1, gives cost of lumber to planer.

Note 10. Waste. Unless lumber is surveyed into the planer and a daily waste record taken, frequent tests should be made to ascertain the waste factor. The average waste will be about 17 per cent. To ascertain the cost of lumber in 1,000 ft. of shooks subtract the waste percentage from 100 per cent. (100 per cent. less 17 per cent.) which gives 83 per cent. Divide figure shown in Item 9 by 83 per cent., which gives cost figure to be used in Item 11.

Salesmanship for Box Manufacturers

Real salesmanship as displayed by a few box manufacturers is producing results to-day. Real salesmanship does not mean the sacrifice of quality, mis-cut shooks, indistinct printing and all the other items that make for speed in manufacture in order to meet the other fellow's price. Some of this is being done, but trade secured under such circumstances is not permanent. It is a price meet price, dog eat dog proposition.

When the real salesman comes along such tactics worry and cause trouble, but, that is his opportunity to display his training and he is doing it.

Stop and consider for just a moment the many angles of the selling game. Consider the wonderful opportunity given through handling the package question as it should be handled.

The railroads, trade associations, chambers of com-

merce and shipping organizations are looking to the container manufacturer t ohelp in designing better boxes; boxes that will safely carry the product through to destination. Boxes that will be stronger, that will eliminate danger of pilferage and that will stand the ordinary hazards of transportation. All this can be accomplished and without the use of additional lumber. In fact, the tests made at the Forest Products laboratory demonstrate that in general increasing the thickness of sides, top and botto mabove ⅜ in. does not materially strengthen the box. Thicknesses can be reduced provided cases are properly nailed. The reduction of thicknesses and the addition of a strap or two means a cheaper and stronger container.

The railroads demand that loss and damage claims be reduced. nI the packnig of articles subject to pilferage, the box salesman can show the prospective customer that the use of corrugated fasteners on the inside of a box—the boards in the sides, top and bottom of the ordinary box to be joined with three fasteners in each joint—and if further secured through the use of strapping around each end, will prevent the drawing of nails and sliding of a board to reach contents. The use of corrugated fasteners eliminates the necessity of matched stock (tongue and groove) for butt joints with fasteners give a stronger case than matched stock with fasteners.

A style 2½ box ⅜ in. all around, 13/16 in. cleats, with corrugated fasteners between joints and properly strapped, is a good insurance risk. All shipments do not require such strength, but many heavy boxes used to-day can be reduced in weight.

Think it over. Study the needs of your customers. Study scientific box construction. The salesman that takes advantage of laboratory data and sells service along with his boxes has learned the art of selling in this era of severe competition.

Wood Boxes Won Out

A large wholesale grocery house recently set out to secure the best containers for the products handled and to see that as far as possible manufacturers of lines purchased shipped such goods in suitable boxes. They decided that they would try and have all goods packed in wooden containers. The following extracts are taken from a letter addressed by the general manager of the firm to the buyers:

I am particularly against receiving so many goods packed in paper cartons. Glass goods, green or fresh soaps, canned goods, etc., are being delivered to us in paper containers. Glass goods are easily broken, so they can not be shipped a long distance; green soaps if piled in a freight car with a weight upon them are crushed, and if one or two containers of canned goods swell the whole package is spoiled.

We have recently sent the enclosed letter to our buyers instructing them if they can get away from this abuse to do so.

Here are the specific instructions issued to the buyers:

We are having too many goods delivered in paper containers.

They can not be shipped for export.

They can not be opened for sampling.

They crush easily under the weight of other goods when loaded on trucks, cars or steamships.

They egt wet and show damage.

If they contain liquid or moist goods like soaps or seeded raisins they crumple up.

We can get nearly all goods in wood if we insist on it.

Macaroni, vermicelli, raisins and hundreds of lines we handle can be bought in wood if buyer will think of it and insist on it.

Where it seems impossible to buy at best prices, unless we take containers, then, and then only, we want at least one-half of the order in wood.

You must respect this request and act accordingly. Always ask how goods are packed, put in your contract or order "wood cases only," and have enough sand to stand by your instructions.

Meeting Competition in Box Industry

Secretary H. L. Pease of the National Association of Box Manufacturers, Chicago, recently distributed the following bulletin to members, which not only exemplifies what can be accomplished by studying a consumer's container requirements, but incidentally the value of interchanging information.

"We have received correspondence from members of the association, indicating that our first letter of July 8 in regard to the reduction in thickneses of box parts has met with result. Many of our members, during the past thirty days, have ben able to redesign cases, giving boxes of lighter construction, and through such service have been able to compete with substitute containers. This campetition has not been entirely on a price basis. Selling price must be considered, but strength, serviceability and other factors have played an important part.

"The following from one of our members shows what can be done if a little time and study be devoted to scientific construction.

" 'One of our customers has been using a box with ⅜ in. sides, top and bottom, and 13/16 in. ends, with no cleats. When well nailed this box gave good results, but when tested it failed on the first drop of 36 inches.

" 'We changed the box byq using the same sides, top and bottom, with only half-inch ends, but added two cleats on each end, 1½ in. x ⅝ in.

" 'This box not only stood eight drops of 36 inches, but also eight drops of 48 inches and five of sixty inches before it gave way. Skillful designing produced, therefore, a box two o rthree times as strong, somewhat lighter, and at a saving of 2c per case..' "

Hints for Hardening Cutters

Good tool steel is very sensitive to differences in the water in which it is hardened. The softer the water the better will the tool harden. Too much emphasis cannot be laid on the necessity of having an ample supply of water when hardening high-speed steel tools. If possible it is advisable to have the water running, even if only slowly.

Generally speaking, good tool steel needs no mixtures or compounds or solutions added to the water at all; the purer the water the more satisfactory will be the results. If, however, it is desired to scale a tool for a special purpose, a little salt added to the water is permissible. Of course, sea water is the keenest natural water for hardening, but it strikes too keenly for general use, especially woodworking tools.

When hardening tools in an oil bath, a little sal-ammoniac added to the bath will help cutters to come out with a clean surface.

Machinery & Equipment

Yates Open Back Nailing Machine

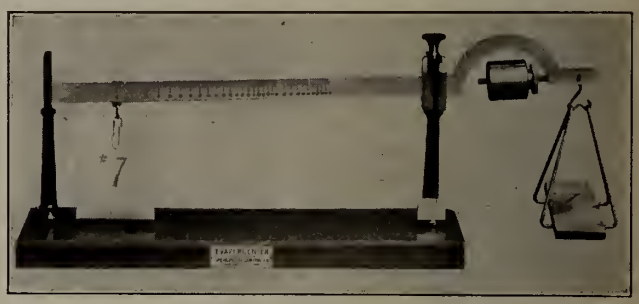
A new piece of equipment in the shape of an open back nailing machine, shown in the accompanying illustration, was recently placed on the market by the P. B. Yates Machine Co., Limited, Hamilton, Ont. This is what is known as a 30 in. machine, and is made in three models—No. 830, No. 930 and No. 1030—which are designed to drive, respectively, eight, nine and ten nails at one operation. As the name implies, anopening has been provided in the back through which the stock may be passed, enabling cleats to be attached anywhere on the shooks. Extreme distance possible between nails is thirty inches, and they may be driven as close together as 1⅜ inches. The driving chucks are atached in two rows, enabling the nails to be driven in one or two rows as desired. As equipped the machine will handle nails from 1¼ to 2 in., but special feed disks may be had for other sizes. A clinching

New Yates nailing machine

device is provided for clinching the nails in batens on cleated boxes. If the nails are not required to be clinched, this device may be rendered inoperative. Suitable gauges are furnished for holding the work in various positions. Special gauges have been designed to gauge the cleats when nailed on the ends of the shooks. While it has been designed primarily for belt drive, provision has been made whereby it may be quickly changed to motor drive. The recommended speed is 500 R.P.M., and the power required is five horsepower.

The National Evapercenter

Many plans have been perfected to determine the moisture content of lumber in process of drying and many of these plans are scientifically correct but are difficult to follow in the field. The "Evapercenter," which is probably the latest device for determining the moisture content of lumber, is so simple, however, that it is easy to operate and may be termed "fool proof." By referring to the illustration, the character



Instrument for determining dryness of stock

of the instrument is easily seen and the method of operation is also fully shown. An envelope is first attached to the scale bar at zero and then the test piece of lumber is placed on the scale. A balance is then secured by pouring "counterweight material" into the envelope until the scale balances. The envelope and the test piece are then removed and the number of the sample plainly marked on each. This operation is repeated on as many pieces as it is desired to test and the pieces are then heated in an oven until bone dry. When dry the test pieces are returned to the scale, one at a time, and the envelopes of corresponding numbers are hung in place. The envelope slide is then moved along the scale until a balance is again secured and the scale reading gives the percentage evaporated from the lumber. By this method the percentage is determined without the actual weight being known. This instrument is being placed on the market by the National Dry Kiln Co., of Indianapolis, Ind.

Automatic Hollow Chisel Mortiser

Herewith is shown an automatic hollow-chisel mortiser built by the J. A. Fay & Egan Co., 153-173 West Front St., Cincinnati, Ohio, U. S. A. It is adaptable for use in carriage, furniture, sash and door plants, cabinet shops and manual training schools.

The column is a rigid casting with broad floor supports. Chisel mandrel runs in self-oiling bearings, mounted in a housing traveling in gibbed ways on column, having a stroke of 4-inch by means of a crank plate, driven by worm and worm gear with quick-acting clutch. Two speeds of feed are provided by means of cone pulleys. The table is 5-inches wide, 36-inches long and has a vertical adjustment of 12-in. by means of ratchet lever; is provided with an automatic disappearing stop guage and arranged to angle 40 degrees either way. Stop guages can be set for several mortis-

es of different lengths, which means saving in time, as this eliminate marking off each piece of stock to be mortised.

The machine is entirely self-contained having coun-

Fay & Egan hollow chisel mortiser

ter-shaft mounted in base with convenient adjustments. It will mortise to a depth of 3½-inches.

Hardware for Factory Trucks

In addition to making a complete line of woodworking equipment the Oliver Machinery Co., Grand Rapids, Mich., are devoting considerable attention to factory trucks and truck hardware. This latter idea should have an especially strong appeal to woodworkers, not only because these parts are being sold on a foundry basis, but because the lumber necessary to build a truck is always available in any shop and the parts themselves weigh less and take a lower classification than the finished article. As will be noticed from the accompanying illustration, everything is shipped complete ready to be attached, even to the bolts and screws. Factory trucks are necessary to the economical handling of stock, and by making them in his own shop, a manufacturer is sure of securing trucks which are peculiarly suited to his own particular requirements.

Foreman and Labor Turnover

Production is the largest recognized problem of the manufacturer. Increased production is the great essential by which success is measured, and only by limiting production does the manufacturer gain or lose accordingly. Therefore, we should not permit a principle so vital pass without considerable and serious thought.

In an effort to increase production much money is spent in developing high standards of mechanical equipment, methods, processes, etc., while comparatively little thought is given to the individual employee who is actually responsible for its success or failure.

A large labor turnover and other labor difficulties are the prime evils which hinder increased production. To the worker the foreman represents the management. The foreman being the bridge or link between the management and worker, consequently should be chosen with great care. He should be endowed, first of all, with a natural broad vision in all things, and should be chosen not only because he is a good worker and understands machinery, but he should know men. More intelligent foremen mean a more intelligent understanding of management and worker.

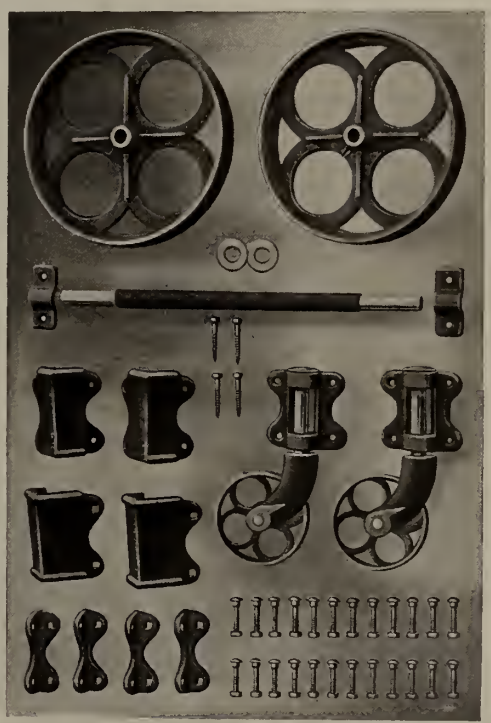
The fundamental policies of an organization should be clearly defined to the foreman and reasons behind these policies should be shown to him. Assuming that the foreman measures u pwell in amount of intelligence, loyalty, understands manufacturing, and has a knowledge of men and how to handle them and knowing the basic principdes and policies of the management, he should be impressed strongly that the burden of increased production rests entirely upon him.

The management should constantly keep its foremen on "their toes" so to speak, by impressing upon them that the most important of all things entering the race for increased production is labor, and that a large labor turnover is not conducive to increased production.

The foreman should be taught to make a systematic study of the men under him, and if there is a man in his department whom he considers a "weak link" in the chain necessary for increased production, such man should be replaced by another man or stronger link.

Williamson Veneer Appoint Representative

The Williamson Veneer Company, Baltimore, Md., announces an addition to its selling force which will undoubtedly be interesting to the trade. H. F. Wilke of Chicago was for many years associated in the selling capacity for George W. Stoneman & Co. of Chi



Illustrating "Oliver" truck hardware

cago. One of the most valued lines of veners handled by the Stoneman Company was that of the Williamson Veneer Companl, with which Mr. Wilke was personally very closely associated. With theestablishment of direct sales offices six o reight months ago, the Williamson product is now being marketed in the middle western territory through its Chicago office, 28 East Jackson Boulevard. Mr. Kilke will be one of the middle western representatives, being associated in this territory with R. J. Cavanaugh and C. S. Connor.

Upholstering and Trimming

Modern Upholstering

How Back is Upholstered When Springs Are Not Used -- Treatment of Arms and Wings

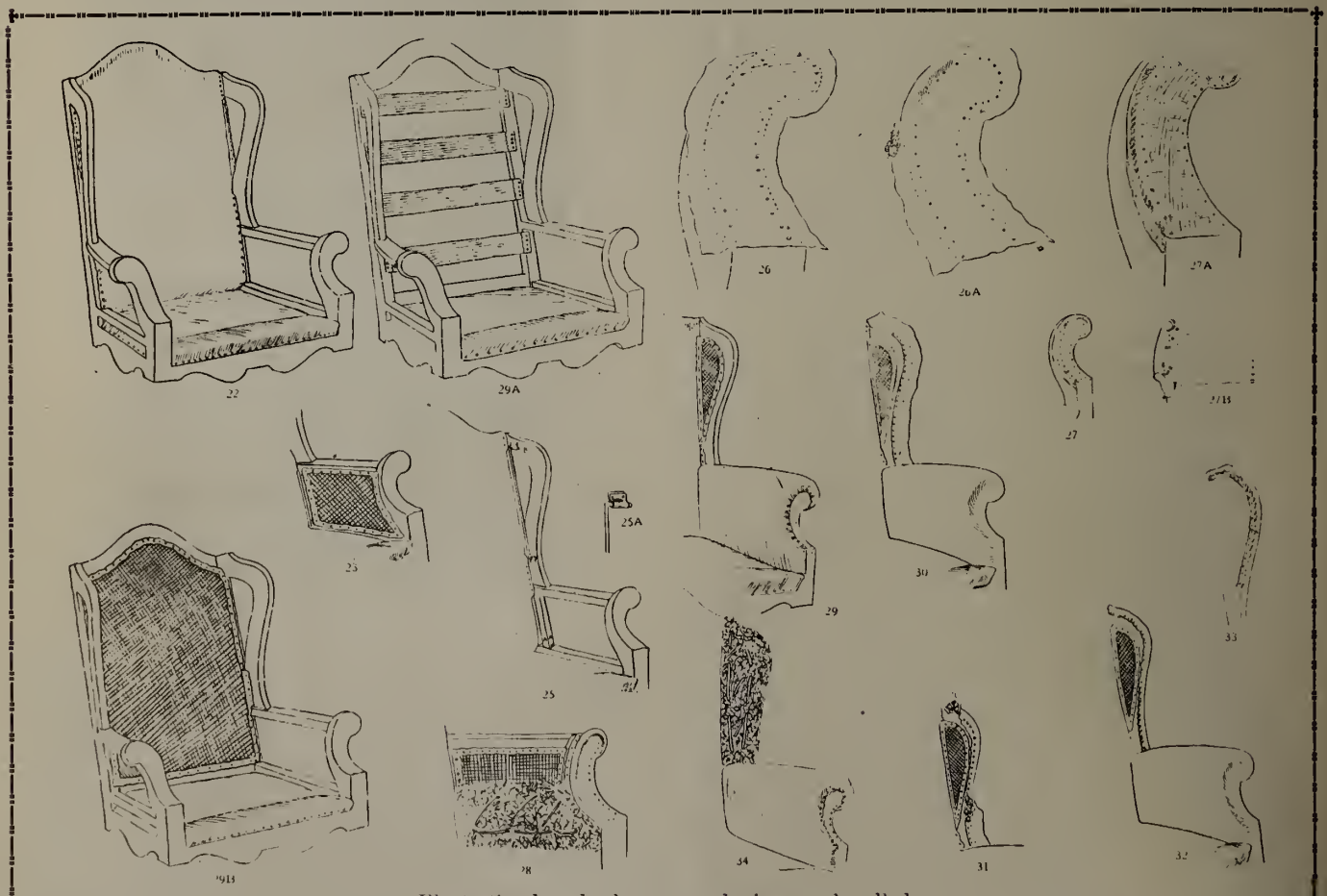
As mentioned in a previous paragraph, there is a way of upholstering, without springs, the back of the chair we are describing. In such a case, four or five rows of webbing are attached to the face of the back, as shown in Fig. 29a, and a stout canvas is stretched over the webbing, a sFig. 29b. The webbing should not be stretched to its utmost possibility, but should be allowed to retain a certain amount of its natural elasticity, permitting the back to give slightly under pressure, without creating an unsightly bulge at the outside back of the chair.

After the canvas is attached the chair is upholstered in the same way as described in connection with Figs. 17a, 17b, 17c and 18. This gives the appearance of the chair now shown in Fig. 22.

The next step in the upholstering of this chair is the treatment of the arms, which must be canvassed, as indicated in Fig. 23. Some support, however, must be provided for the bac kedge of the canvas so that, between the upholstering of the arm and that of the back, a crevice will be left through which the back edge of the arm covering may be drawn.

This support may be provided in either of two ways; by tacking a wire, as shown at "b" in Fig. 25, or a block, as shown at "a" i nthe same diagram. The method of attaching the wire is shown in enlarged detail in Fig. 25a. Where the wire is used the canvas is passed around and sewn with long stitches while the balance of the canvas is tacked in the regular way.

The next step is the formation of the nosing around the inner edge of the arm. A piece of canton flannel larger than the face of the arm is tacked, as indicated in Fig. 26, keeping the tacks about one-half inch from the edge of the arm. The surplus material, which goes beyond the edge, is then stuffed up to form a nosing, as indicated at "x" in Fix. 26a. This diagram shows the commencement of the nosing. The stuffing is continued down on the inside edge of the arm to the point where it joins the seat and is continued also around the top curve of the arm, diminishing in size until it practically dies away at "a." No nosing is provided on the edge between "a" and "b" for this type of chair, but the surplus material is carried around the edge and tacked to give a finish.



Illustrating how back, arms and wings are handled.

After the nosing has been entirely formed, it is regulated into shape and stitched so as to have the appearance of Fig. 27. Note also the enlarged detail diagrams 27a and 27b, which give a clearer idea of the stitching.

The next step is the lacing on of the hair, as shown in Fig. 28, the compact mass being kept uniform and carried up over the top of the arm smoothly, so as to produce, in the muslin, the shape shown in Fig. 29.

After both arms are done, the wings are next in order, these being first canvassed, as shown in Fig. 29. Then the flannel for the nosing is back-tacked on the edge of the wing, as shown in Fig. 30, and this also is stuffed up and tacked to provide a compact, smooth edge, as indicated in Figs. 31 and 32, and in the stitched form shown in Fig. 35.

The operation of forming the nosing can be reversed by tacking the inside edge of the flannel, then stuffing it and tacking the outside instead of back-tacking the outside edge, stuffing it and then tacking the inside, which is shown in connection with these figures, and an equally satisfactory job can be done either way.

(To be continued)

Upholstering Material Market

It has been suggested that upholstering fabrics may be scarce and difficult to secure this Fall. The mills have boked a fair volume of business for Fall, but evidently not one that will be equal to the needs of the trade for the Fall season. It is remarked that the buying conditions have been such that when the retailing and selling season is well under way there is likely to be a shortage of some of the wanted fabrics and patterns. The department stores have been purchasing in this line in about the same proportion as throughout the entire drapery field and no doubt reorders will be the rule. A considerable business has been booked from furniture manufacturers. The Philadelphia mills are working quite actively on orders in hand. They have been offering a wider selection of patterns than usual and buyers have naturally spread their purchases over a wider range of designs, which with but moderate average aggregate purchases, means a small representation of each pattern. A considerable quantity of imported material is coming on the market. This includes new ideas in French and English cretonnes and linens, glazed chintz and toile de jouy. Lamp shade manufacturers will find attractive assortments of galloons, tassels, fancy nets, and plain and figured silks.

Colors in Furniture Decoration

At a recent furniture exposition, exhibits which showed the use of color in the decoration of the furniture displayed proved to be extremely popular.

Color in furniture decoration is as old as furniture. The ancient Egyptians and the Greeks and other peoples of antiquity made a greater use of color than we do today. The spirit of the whole Renaissance was for form and color suffered so largely, that even today we are far less venturesome than our ancestors.

In the early English periods, chests and coffers were noteworthy for color decoration. Up to the time of the Puritan regime, color held its own but Puritan austerity frowned upon it. After the Restoration color came back into its own in the William and Mary period but the influence of Chippendale, who was primarily a wood carver, acted against the use of color. When the style of the Brothers Adam succeeded Chippendale's influence, color regained its place.

On the continent of Europe, color always played a big part in furniture decoration except as the spirit of the Renaissance for form crowded it out. Among the legacies which the Bavarians brought to America was this use of color and all down through the Cumberland Valley of Pennsylvania and in other parts of the state settled by the early German immigrants, dower chests, cabinets and other articles of furniture show this influence and are richly colored.

The growing popularity of the so-called breakfast room suites has been a big item in the increase of the use of color in enamelled furniture. The "parchment" and other like finishes are evidences of the same growing popularity of color in furniture decoration.

Color has maintained its hold under discouraging conditions and with favorable conditions will prove its worth and win great popularity.

Asssciation Officials Tour Ontario

A number of the officials of the Furniture Manufacturers' Association recently motored through part of Western Ontario, calling upon the furniture manufacturers, in the interests of the various activities of the association. It is proposed to continue these trips until the whole province has been covered. Those making the tour are:—J. H. Baetz, chairman of the association; Wm. Cawkell, secretary; Jas. E. Ferguson, in charge of the cost accounting department, and T. Lyle Blogg, manager of the Home Furnishings Bureau.

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Any Size, Height or Gauge

No charge for boxing or cartage

We make metal strips or supports with 2, 3 or 4 springs to the strip, any height, length or lifting power

Send Size for Sample

Assembled constructions for Couches, Day Beds, Davenports, Chaise Lounges and Cloth Covered Loose Pillows.

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FURNITURE LEATHER

OF EVERY DESCRIPTION

We are making a specialty of cutting

Spanish Split Leather for Chair Manufacturers

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We will be pleased to supply a very attractive sample book, of all our grades on application.

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DOON TWINES, LTD.

Manufacturers of

Flax, Hemp and Jute Twines and Cordage

"QUALITY AND SERVICE"

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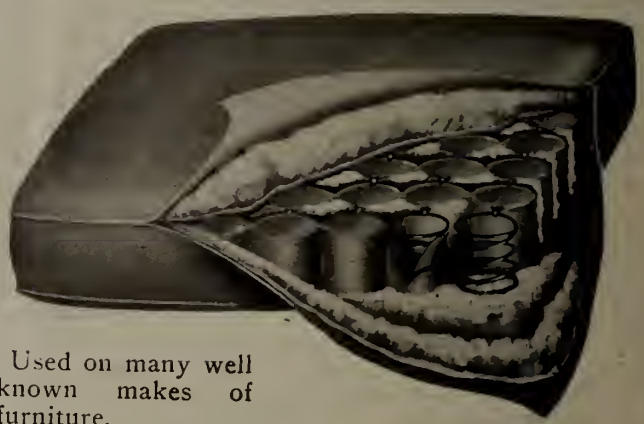
Famous "Comfy" Cushions

This is the much talked of cushion, that gives furniture the real touch of luxurious comfort.



Used on many well known makes of furniture.

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All inquiries handled promptly

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IONIA, MICHIGAN

Securing Satisfactory Enamel Finish

Enamel and Polychrome Finishes Becoming Quite Popular

By R. A. Telfer

Enamelling is one of the processes where each artisan and even each finishing room may have developed special methods. It is said that some of the factories have carried this development to a great degree and that in them the process of enamelling is specialized and particular in most respects.

The foundation of all good enamelling is a surface which will carry the enamel in the right manner. This is as important as the foundation of a skyscraper is to the integrity of the superstructure it carries. Just as the sturdy foundations of a giant building must not fail in any particular, so, too, must the surface upon which the enamelling is done maintain a lasting uniformity of the right kind.

Surface Should Be Perfect

All indentations in the surface, all cracks and crevices of every nature, all nicks and other irregularities, must be filled in and sanded smooth. The surface is then, generally, treated with a base filler which is allowed to dry thoroughly, the time varying from one to two or more days. Many finishing foremen then put on what is known as a shellac wash which is very thin. The surface is again sanded and thoroughly dusted.

The first undercoat is then applied. Undercoats are made from basic materials which are grounded in a specially treated wood oil. These materials, which are used as the bases of first coaters, are very dense pigments and form a foundation for the succeeding finishing materials. The undercoats play the same important part as do the elements which bind together the foundation stones of a building, cementing the foundation into one solid and smooth and even mass upon which the superstructure can be builded with every guarantee of permanency and endurance.

Two Applications of Undercoater

Two undercoats are usaully applied. The first coat is usually thinned out in order to permeate the wood fibres and bind firmly into them. The second coat is heavier, as it has the first coat upon which to stand. The first coater is sometimes tinted toward the final color of the finish and the second is made as near the desired color of the final finish as it is possible to color it. Ivory is obtained by tinting the coaters yellow, red or orange.

When a satisfactory job is obtained by the use of the first coaters which bind firmly into the wood fibres and make a lasting uniform surface which is full and yet transparent and which allows the firm adhesion of the succeeding finishes, the job is ready for the immediate process of enamelling.

Proper Brush Important

The enamel is flowed on with a chiselled varnish brush and is put on thin. Extreme vigilance should see that the worker uses the proper kind of a brush. Most foremen have found that a better-than-usual bristle brush is less expensive in the end, even if the initial cost is larger. Enamelling is one of the processes where good tools in the shape of proper brushes are necessary to real good jobs. Too much saving is not true economy in this particular case.

The good enamels are easy to apply. They do not streak and the brush marks are not visible. The enamel should not set too fast, giving the coating the chance to flow out smoothly. Climatic conditions and temperature may affect this part of the job and conference with experts at the finishing product company's headquarters is sometimes advisable. Wood finishing companies have laboratories and chemists who are ready to serve the users of their products and conferences with them solves many problems in the finishing room, not only in regard to enamelling but also concerning many other processes.

Pure white enamel which sometimes gives a sickish appearance is sometimes strengthened by the addition of a blue coloring material. Undercoaters and enamels are mixed to obtain certain results.

Properties of Good Enamel

A good enamel has a firm color and a sufficient body. It flows freely and spreads with ease. The good enamel dries steadily and does not lose its luster in the drying. The final finish is porcelain-like and does not chip or crack. The color is preserved in the final finish of a good enamel and there is no suggestion of a pink or blue cast.

Final finishes of enamel are egg-shell, satin and gloss. The egg-shell is similar to a rubbed finish. The satin finish is obtained by rubbing with powdered pumice and finishing off with a rubbing of oil or water. Rubbing felts are soaked with the water or oil and dipped in the pumice. Care must be taken to remove all dirt or dust marks. Enamel is usually allowed to stand six or seven days before being rubbed.

Polishing Final Operation

Polished finishes are obtained by polishing with rottenstone and finishing with oil or water. For this a soft cloth, such as cotton waste, is saturated with the oil or water and dipped in the rottenstone. The rubbing continues until the desired high lustre appears. The rubbed finish is then allowed to stand for a period before polishing.

Lemon oil is sometimes rubbed over the entire surface and wiped off with cheesecloth that has been dampened with alcohol, great care being exercised not to use too much alcohol which would burn the finish. This rubbing is done as rapidly as possible.

Enamelling is a process which demands care and study. A poor job is perhaps among the most noticeable of failures in the manufacture of furniture. The progressive manufacturers of wood finishing products are ready to consider the problems which the finishing rooms of furniture factories present to them and by a close co-operation the integrity of good enamelling is constantly maintained.—"Furniture Factory."

Varnish Ills and Antidotes

Blistering—Several causes, chief among which are oil, grease or moisture under the varnish coat; if the wood was not dry before application of varnish, and heat comes in touch with it, the varnish is likely to raise up.

Blooming—The finer the varnish the more sensible to bad air. Ammonia fumes very bad. New varnish may bloom. If any adulterated oil has been used beneath the varnish the latter may bloom. Undry undercoating a cause. Too much drier in the varnish bad. Bloom is like what you see on a ripe plum, and it may be removed by washing in cold water.

Silking—The surface looks like silk, hence the name. There are several forms of silking, as enameling, its lightest form; may come from working in a cold room or applying varnish to a cold surface, exposure to cold draft of air during its application, undry undercoats, or to adding turpentine to the varnish.

Bubbling—If your varnish happens to be a little warm small bubbles are likely to form on the coating of varnish, but this is easily rectified by cooling the varnish.

Mixing Dry Materials

Dry pigments, such as umber, sienna, lamp black, etc., are mixed with difficulty; but, by adding a small amount of alcohol, and working to a paste, they will then readily mix with oil.

Dry colors, as above, when needed for water colors, will mix and work better if made into a paste with either vinegar or alcohol, before thinning out with water. However, if these colors are to be used with an air brush, don't use anything but water.

If there are any odd lots of hard lead, zinc or paint, (or paint skins) run them through a meat cutter (such as is used by the household), and if particularly dry, add a small amount of linseed oil, and by this means of working up, all this old stuff, it will be readily made over into usable material. It may be necessary to run some of it through the machine twice to get a perfectly fine product.

Another plan for softening up old putty is to place the putty in warm water, and leave it on any heating system, in order to keep the water warm, and after the putty is warmed through, it can be easily worked up into a working consistency.

A Warning

A subscriber has written in suggesting that we warn our readers to be on the lookout for a man by the name of "Campbell," who is calling on the different woodworking plants selling formulas for celluloid and enamels. This chap is very plausible and tells a good story, but as the formula has proved to be useless, the addresses he gave fictitious and none of the firms mentioned as being able to supply the necessary raw material know Mr. Campbell nor have heard of the products mentioned, it would appear as if this man is an out-and-out faker.

We quote from a number of letters received from supply houses in the States:—"We are sorry to have to advise you that we are not in a position to supply metal dyes. As a mater of fact we do not know what these preparations are. In this connection we would mention that we have received numerous inquiries from concerns who have, apparently, received some formula from a Mr. Campbell, but have no idea what is referred to. We have endeavored to get in touch with this man but have been unsuccessful in our attempts to find him."

"You have, undoubtedly, been referred to us in error by Mr. Campbell, as we neither manufacture nor handle P. and L. flake white or wood dyes soluble in methyl acetone. It seems that this Mr. Campbell has been travelling throughout the States and Canada selling formulas for making celluloid enamel, and we cannot understand his reasons for referring people to us. We do not know the man and have been unable to locate him at several addresses which he has given, and while he may have acted in good faith, we are inclined to believe that he is an imposter."

The following item taken from the "Oil Painted Drug Reporter" of September 9th, 1918, would seem to indicate that this man has been at this game before. The item in question is headed "Warning," and goes on to say that an individual using the name of "Campbell," and claiming connection with the firm of John Campbell & Co. of Newark, N.J., has been travelling throughout the country selling formulas and recipes for lacquers and finishes made from colonial products. We have received numerous letters of complaint and wish to inform the trade that this man is not and has not been in any way connected with our firm."

Portable Spray-painting Equipment

The DeVilbiss Mfg. Co., Toledo, Ohio, recently issued a circular covering their improved portable spray-painting equipment. This is suitable for painting the interior and exterior of industrial public and residental buildings of all kinds. The equipment is put up in different sizes, including hand truck outfits for one and two operators up to a Ford truck outfit.

It would appear as if the spray painting of large surfaces is rapidly replacing the slower and more costly hand brush method. Paint may be applied by this method three to five times as fast as with a brush. The loss of time required to dip the brush and the continuous refilling of the paint pail is done away with. Another feature is that spray equipment is just as efficient in difficult ad out-of-the-way places as on flat plain surfaces.

While the class of work being done and the kind of material being applied govern the surface which may be covered, it is estimated that one man can paint 500 feet in an hour.

Wood Composition

A very good wood composition can—writes a correspondent—be made as follows: Take about 28 per cent. by weight of powdered lime, which must be freshly slaked; to this add about 2 per cent. of powdered alum and 20 per cent. fresh, strained cattle blood. Stir well together and mix into the liquid as much fine sawdust as it will carry, stirring and adding the sawdust until the composition is fit for use. It is not advisable to use sawdust made from any resinous wood, as the action of the lime affects it.

Comparing Different Stains

Water or acid stains, owing to their slowness in evaporation as compared with oil stains which contain very volatile solvents, will go on and stain wood with a far less tendency to streak. Alcohol or spirit stains are the worst offenders in this respect, owing to the very rapid evaporation of the solvents.

Linseed Oil has its best equivalent in "FLAXICON." Either in boiled or raw, is elastic, durable and waterproof. Working to the best advantage with colors ground in oil.

Penfound Varnish Co.
CARIBOO AVE. - TORONTO

Cut Down Your Refinishing Expense

Revarnishing is an expensive, slow and unsatisfactory way to handle marred, scratched or damaged furniture. It takes days for drying and rubbing and requires an excessive amount of material and labor.

Refinishing is absolutely unnecessary. There is a way to avoid the grief, delay and expense resulting from injury to the varnish.

FREE BOOKLET

Ask for our Free Booklet, "How to Repair Damage to Varnished Surfaces." It will explain how to avoid revarnishing, how to fix any injury to any kind of finish quickly, easily and without waiting for varnish to dry. WRITE TODAY.

If you are too busy to write a letter pin this ad to your card or letterhead.

THE M. L. CAMPBELL COMPANY
FINISHING PRODUCTS
2338 Penn St., Kansas City, Mo.

"ENAMELS"

Our business in both White and Old Ivory Enamels and Primers has trebled during the past year.

WHY?

They are the best on the market. If you are not using them, write for samples and prices.

The **Ault & Wiborg Co. of Canada, Ltd.**
Varnish Works
Montreal Toronto Winnipeg

Meeting Present Conditions

By W. WARREN

In the woodworking industry we are confronted with conditions totally different to any before experienced. To-day efficiency is the factor which often decides our success or failure.

In thinking of efficiency we must not think of it in a theoretical or superficial way but must apply it to our needs in a practical manner. An efficient workman receives greater remuneration than his less-efficient brother; an efficient firm gets greater and more profitable patronage on account of their standard of efficiency and so the value and effect of this quality can be traced throughout our whole operation. Efficiency is the ability to render adequate and satisfactory service, not ordinary, average, every-day service, but extraordinary service. Nature has placed within us the power to give this type of service. Every piece of work or order we get is secured in the face of keen aggressive competition. The margin or difference between cost and selling price has very nearly disappeared. This is the buyers' day.

If we sell millwork and lumber without service we will soon be without orders. If, on the other hand, we sell efficient service as well, it will bring us many orders that would otherwise go to competitors.

Under existing conditions it is almost impossible to operate profitably. Dividends, if secured, will be the result of the efficiency of our operations. Cost of manufacturing and handling has been abnormally high and must be reduced to a minimum.

The length of time taken to execute an order has in the past been too lengthy. We must be prepared to meet even unreasonable demand of exacting customers. The time was when the cutsomer had to await the convenience of the mill, yard or factory. Things have taken a right about face. Any delinquencies on our part will work out to our advantage.

Individual efficiency coupled with an earnest desire to interlock and co-operate will bring out and develop a smooth-running and efficient organization. One that will reap, at least, all the advantages which existing conditions may offer. May I then suggest that we carry on a campaign of efficiency, endeavoring to round off every corner, reduce the cost of handling ann cost of manufacture, increasing our output, execute our orders more promptly, using every means at our disposal to reduce costs and serve the public better. Our value to our employees is just what we are worth ourselves. Service and reward between employee and employer is equal, as is also service and patronage between buyer and seller.

Your assistance and co-operation is requested in an endeavor to make our plant the most efficient of its kind.

Furniture Cannot Go Much Lower

A bulletin recently issued by the Department of Labor, which gives a comparative statement of wages paid in all lines of industry both in this and foreign countries prior to, during and following the war period shows that in November of last year wages in the furniture and cabinet field labor was receiving an average of 126.9 per cent. more than it did in 1914.

Statistics compiled by Associated Furniture on June 1st show that the average reduction from peak wages has been 15.6 per cent. on skilled and 17 per cent. on unskilled, which would leave the wage level at the present time 105.3 per cent. over pre-war scales.

Nichols Varnish Drying Equipment

A complete unit of fan, motor, heaters, air compressor, with automatic temperature and humidity controls for the correct drying of all coatings on the finest pianos, talking machine cabinets, furniture, automobiles, etc. A new humidifying air washer, which eliminates all dust and dirt, does away with all spray heads and connecting piping.

Will triple the output of your finishing rooms; decrease the congestion in your factory; reduce investment of goods in process and improve working conditions for your employees.

Better finish, scientifically dried from the inside out.

We will analyze conditions in your plant and submit a proposition covering an equipment suitable for your requirements, whether it be for automobiles, talking machines, pianos, furniture or railroad cars.

We have exclusive authority to issue license to use the Grosvenor Process Patent in all territory East of the Mississippi, Ohio and Detroit Rivers in the United States and Canada, the only varnish drying process that simultaneously subjects the coatings to the action of moisture in excess of natural humidity.

We also manufacture the Nichols Lumber Dryers, Veneer Dryers and Hydraulic Pumps. It will pay you to address us for further particulars.

A. S. NICHOLS COMPANY Aeolian Hall **New York City**

Increasing the Speed and Decreasing the Cost of Your Finishing Room Operation

How practical, how advantageous and how dependable DeVilbiss Spray-painting equipment is, has been demonstrated in finishing rooms of every size and line.

Not merely in dozens of finishing rooms, but in thousands of them. Not only where a few different kinds of articles are handled, but where every kind, size and grade of wood or metal product is finished. Not alone where varnishes, enamels or lacquers are used, but where every kind of liquid finishing material is applied.

DeVilbiss
Spray-painting System

offers a complete, adaptable and guaranteed service. The finishing operation is speeded up 4 or 5 times over hand-brushing. A perfect, uniform coating is applied on all jobs. Working conditions are made more healthful and safer. Operating and upkeep costs are reduced to the minimum.

With your consent, we'll gladly tell you whether and how the DeVilbiss System can be of service and profit to you.

The DeVilbiss Mfg. Co.
3718 Detroit Ave. ***Toledo, O., U.S.A.***

Paint your factory walls faster and better with the DeVilbiss Spray-painting portable equipment. Let us explain.

WOOD STAINS

Soluble in

WATER, SPIRIT, TURPS, &c.

Highest Concentration
Complete Solubility
Best Value

In Imitation of All Natural Woods

We are Especially Strong in

BLACKS

and can Meet any Competition

Williams Bros. & Co.

Estd. 1877

Hounslow - England

ZERO

Natural West Va. Rubbing Oil

BEST Because that beautiful shining surface becomes almost impervious to finger prints

CHEAPEST Because it goes further on the job than Parafine Oil

ZERO

The Best Products

Mr. Furniture Man, some of the best factories find this to be so. Try for yourself.

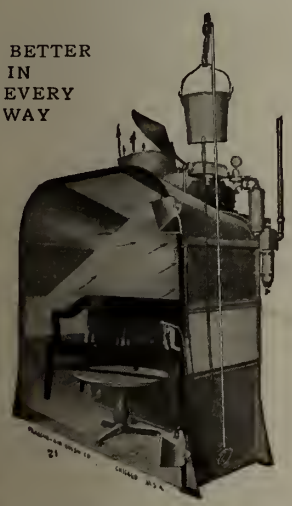
Zero Oil Company

PARKERSBURG, W. Va. - U.S.A.

BETTER FINISHES — LOWER COST — INCREASED PRODUCTION

These are the findings of manufacturers who dispensed with old time hand brush methods. Regardless of your product you will find

BETTER IN EVERY WAY



Paasche Superior Finishing Equipments

Better—Quicker—Cheaper Way to Finish

How many pieces can you finish by hand per week? Multiply by 5 to 8 and you'll get an idea of the importance and value of Paasche equipment to you.

You cannot figure Paasche equipment as an expense—It is AN ASSET and A NECESSITY.

Investigate:—It will pay big returns on the investment.

Intelligent service rendered with each installation.

Write us to-day.

This Most Efficient Air Rubbing Device

It Means Better—Smoother—Quicker and Cheaper Work. Eliminate the Hard Fatiguing, Hand Rubbing Method and operate your Finishing Department on a Strictly Efficiency Basis.

RUBS AS EFFICIENTLY AT 4 P.M. AS AT 8 A.M.
Girls Can Operate Them

Finish With Air Instead of Hair

In hundreds of leading furniture woodworking, piano cabinet plants Paasche Equipment is more than "making good" every work day in the year.

Most efficient and economical air finishing system known. One of our many popular (completely equipped) air finishing outfits as used by furniture plants everywhere. Made in various sizes to meet all needs. Applies liquid materials —all kinds.

Paasche Portable Painting Outfits are extensively used for Painting Interiors and Exteriors.

Paasche Air Brush Co. 1223 Washington Blvd., CHICAGO

Ontario Rep.: R. S. Pollard, Preston, Ont.

Buy and Build for the Future

The woodworking industry to-day is hungry for quality service. The manufacturer possessed of vision, builds for the future, and ensures his business by a consistent supply of high grade veneers.

There is beauty and permanence in our

Rotary Cut Veneers, Birds Eye Maple, Plain Birch and Maple Veneers

The present prices—the quality of our product—the prompt efficient service, these are good reasons why you should buy now.

Birds Eye Veneer Co.

Escanaba - Mich.

BeVeCo VENEERS

Veneers and Panels

Can Warping be Eliminated?

Moisture Cause of all Such Movement, Controlling Moisture Content Should Eliminate Warping and Twisting

By S. H. Johnstone

The discussion on the Science of Moisture Control, by J. F. Hirt, which was published in the July and August issues of the "Canadian Woodworker and Furniture Manufacturer" opens up a new line of thought. If we can at all times control the moisture content of the veneer and plywood, we can control and eliminate all warping and checking during manufacturing operations. Controlling the moisture content of the stock does not present any insurmountable difficulties and the results to be achieved are so alluring as to warrant our earnest consideration.

In discussing this subject Mr. Hirt emphasized the fact that the moisture content of wood tends to stabilize or equalize with surrounding atmospheric conditions, i. e., humidity and temperature, in our plants would result in all stock going through, tending to reach a uniform percentage of moisture content. This is not new theory but has been proved under many and varying conditions. It means that by controlling or conditioning the air in certain departments of our plant or in the whole factory, we can control and determine the moisture content which the stock would ultimately reach if exposed to such constant conditions for a sufficiently long period of time. Again by maintaining the relative humidity and temperature of the air at some pre-determined point, we automatically fix and hold constant the ultimate percentage of moisture content the wood will reach.

Controlling Moisture Content

Now for the practical application of these facts and suggestions. What can be said of one phase of wood manufacturing operations can be adapted to other phases of the same work. We will attempt to apply this idea to veneers and veneered products. In the first place warping, cupping, twisting, checking and similar troubles occur when wood is either absorbing or giving up moisture. As has been pointed out, stock exposed to uniform atmospheric conditions will reach a constant and fixed percentage of moisture content and that moisture content will remain fixed as long as the humidity and temperature of the air do not change. In other words, when lumber reaches the state in which the moisture content is in equilibrium with surrounding atmospheric conditions, moisture will neither be taken up or given off as long as the atmospheric conditions are held constant. Then, if we adopt a standard, it might be 4 per cent. or it might be 6 per cent., and see that all stock is dried to that standard and that the atmospheric conditions in the plant are such that wood dried to that standard will be in equilibrium with the air conditions in the plant, have we not succeeded in securing what might be termed ideal conditions; conditions under which the moisture content of the wood will remain constant and warping, twisting etc., will be entirely absent? The only unfortunate part is that at certain times and during certain operations the moisture conditions are beyond our control.

As yet we are not able to control the conditions to which the veneers, plywood, etc., are exposed while being transported from the manufacturer's warehouse to our own. Someone may suggest that we do not know the conditions under which the material is manufactured and stored. That is true, but as many reliable manufacturers of veneers and panels will guarantee the moisture content of the stock at the time of shipment, we can, if we are fortunate enough to be dealing with such firms, depend upon the stock having been in the desired condition when it was shipped. Perhaps some day this material will be forwarded in hermetically sealed tanks or packages. Until that time arrives, we must take for granted the moisture content of the stock maching our factory is an uncertain quantity.

Redrying is Necessary

To overcome this uncertainty and to prevent complications later on, we must resort to redrying. There are many ways in which this may be accomplished, and it matters little which way we adopt as long as we succeed in securing uniform results. Even though we make a practice of redrying, it is a good policy to give some attention to conditions in the veneer storage room or warehouse. If we permit the stock to become too dry, the loss from split and broken pieces will be unnecessarily high, while if the place is damp, we may be bothered with wrinkled and buckled stock and perhaps a certain amount of mould.

Another time we are confronted with large quantities of moisture is during jointing and laying operations. As long as we use glues containing water, this condition will prevail. To counteract the evil effects of this excess moisture, we must have the stock well dried before gluing, rush the material under pressure as quickly as possible, then after the pressure has been removed, see that the work is held flat and true until dried.

If that is done, we will find that we have nice straight material and as we are again in control of moisture content and atmospheric conditions, we are again masters of the situation and can keep the stock straight and true through all subsequent operations. After all, as stated before, there are no insurmountable difficulties to overcome. It simply requires initiative and a good ventilating and humidifying system.

The real educated man is he who can think out an idea and use his hands and his tools to realize it.

Speeding up old machinery increases the risks of breakages and stoppages. Averaging these up, it will be found that what is gained one way is lost in another

How Do You Sand Core or Face wood

Is one drum with coarse paper better than three drums—Dull paper does uneven work—Stock should be dry for best results

By Arnold Forget

In the past the general practice in sanding corestock in preparation for the face veneer has been (when the drum sender has been used) to use only one drum, with coarse paper, leaving the other drums out of commission. Some recent experiments have shown that a better way is to use all three drums, using the same grade of paper on each and taking a very slight cut. This has more than one advantage over the one-drum method. Where one drum only is used and a heavy cut taken, the paper cuts deeper into the soft parts of the wood than it does in the hard parts, and consequently leaves an uneven surface. For that reason the three-drum method is advised because it leaves a more level surface.

Another advantage is the saving on the paper, because the extra strain on the paper in the deep cut of the one-drum method is out of proportion to the work it does. By using three drums the same quantity of paper will do approximately four times the amount of work that can be done when only one drum is used. This saves not only sandpaper, but also the time required to replace it when worn out.

Securing Best Surface

The same argument applies to the sanding of face surfaces, especially oak, with its extremes of hard and soft places. To make anything like a good job on the face of sawn oak veneer it should be sanded twice unless first scraped, and I would say that it should always be scraped to make it perfectly level, and then sanded lightly with fine paper. The advantage of this will be appreciated by the finisher, who will find that on a surface thus prepared he can produce a better finish with two medium coats of varnish than he can otherwise produce with three heavy coats. The extra time required to properly prepare the surface for the finish is not an expense, but a saving—a big saving of time and material in the finishing room, much greater than the extra cost of doing the work right in the machine room.

It is not economy at any time to continue to use paper after it has become worn dull. Some have the idea that a dull, coarse paper will take the place of fine paper. It is true that a dull paper will make a surface smooth to the touch if sufficient pressure is applied, but it is more a polishing by friction process than one of cutting to a smooth, level surface, and in so far as the evenness of the surface is concerned the last state is likely worse than the first because the extra pressure has been more effective on the soft than on the hard spots, and made them low.

A dull paper following after a coarse paper will not remove the scratches made by the latter, and that is what the fine paper is expected to do. The coarse paper is expected to cut down all raises and make the surface level, and the fine paper to remove the scratches, and if the last paper will not do this the time and effort are wasted. One should fight shy of everything that leads to false economy in the use of sandpaper. Economy is a good thing to practice, but it must be true economy; otherwise it is the opposite sailing under a false name. It is not economy to save a dime in sandpaper, and in consequence lose several dimes in the finishing room.

Have Material Thoroughly Dry

While on this question it might be well to caution against the all-too-prevalent practice of sanding veneered stock, both crossbanding and face, before it is properly dry. It is seldom that face stock is sanded so soon after leaving the press that the friction heat of the drums will soften the glue, but it frequently happens with crossbanding in preparation for the face veneer. Sanding for the face veneer should not be done inside of two or three days, and then only where the stock has been subjected to the most favorable drying conditions. In the case of face veneer the stock should be thoroughly dry before sanding in order to insure a fine job. I remember a man who sanded the stock as soon as possible after it left the press, and gave as his reason the fact that the stock warped, and he had to sand it at once to prevent cutting through th edges which raised up. Of course, he had never been able to get a good finish on his work, but preferred a poor finish to having the veneer cut through. In that he was right, but it was not necessary for him to sacrifice in either respect. We persuaded him to try piling his stock with strips as soon as it left the press, instead of tight, as he had been doing, and allowing it to dry out well before sanding. He did this, and, needless to say, he was able to get a better finish on the dry veneer, and the stock did not warp.

Direction in Which To Sand

In sanding corestock there may be some advantage in sanding at an angle, but for face work it should be run through the machine straight with the grain. By doing this one will avoid the danger of cutting deeply into the grain crosswise and leaving scratches difficult to remove by the fine paper which follows the coarse. There are times when it is necessary to sand across the grain, as on mouldings and ogee work. Much of this work is done by hand and the paper should not be very coarse nor the pressure great. If care is exercised no harm will result. Flat surfaces veneered with crotch should receive as little sanding as possible to get along with. This work should be made smooth and level with the wood scraper and then finished with fine sandpaper with very light pressure, for, like oak, it is made up of many textures, and heavy pressure will make it uneven again.—"Veneers," Indianapolis.

Stop the Belts Slipping

I have known belt slip to reach as high as 25 per cent. and the operator be unaware of it. It is generally the better policy to assume that every belt is a slipping belt, then one is pretty sure to be on the safe side and, incidentally, very near the truth. For certain it is that greatly enhanced all-round results can be secured if every belt is treated as if it is the one and only culprit, irrespective of what prima facie evidence shows. I am an ardent advocate of a non-slipping belt. I don't mean a tight belt, but a belt that is treated or dressed on its working face so that it won't slip even when it is slack.

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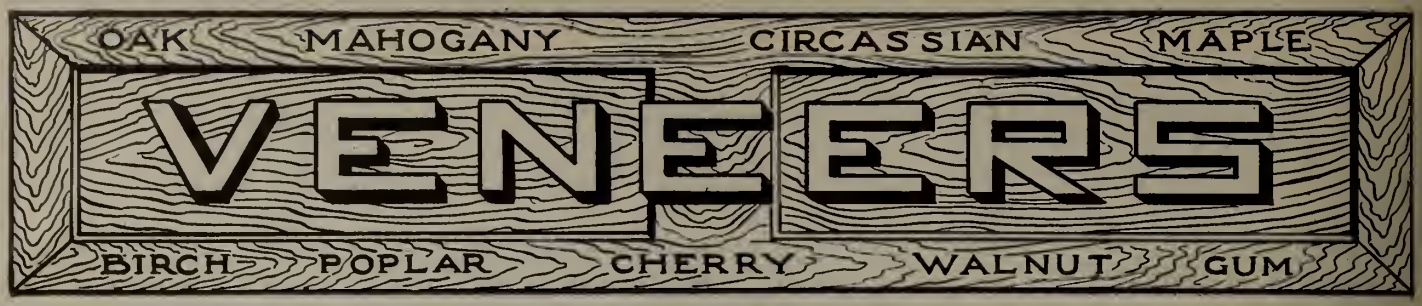

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From the tree to the trade "we make it so we know it's right". Every foot of lumber and veneer is carefully inspected before shipment. Only the very best is good enough to wear the Bachman label.

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AMERICAN BLACK WALNUT LUMBER

FAS—6-9¼" Wide, 8-16" Long

3/8"	3,750 Feet
1/2"	21,470 "
5/8"	44,140 "
3/4"	25,962 "
4/4"	82,502 "
5/4"	26,766 "
6/4"	39,201 "
8/4"	33,140 "
10/4"	14,245 "
12/4"	11,470 "
16/4"	3,700 "

FAS—10" and Up Wide, 8-16" Long

1/2"	9,680 Feet
5/8"	18,980 "
3/4"	14,430 "
4/4"	48,872 "
5/4"	14,165 "
6/4"	10,262 "
8/4"	16,920 "
10/4"	10,250 "
12/4"	1,800 "
16/4"	2,100 "

Fas—6"and Up Wide, 6-7 Feet Long

3/8"	1,200 Feet
1/2"	5,790 "
5/8"	840 "
3/4"	8,940 "
4/4"	32,400 "
5/4"	2,300 "
6/4"	7,800 "
8/4"	1,500 "
10/4"	1,400 "
12/4"	500 "
16/4"	400 "

SELECTS

4/4"	32,940 Feet
5/4"	27,530 "
6/4"	21,480 "
8/4"	33,590 "
10/4"	16,850 "
12/4"	6,054 "
16/4"	1,332 "

NO. 1 COMMON

3/8"	8,000 Feet
1/2"	27,380 "
5/8"	29,850 "
3/4"	31,285 "
4/4"	59,675 "
5/4"	38,240 "
6/4"	18,750 "
8/4"	39,240 "
10/4"	16,363 "
12/4"	4,768 "
16/4"	1,604 "

NO. 2 COMMON

3/8"	1,500 Feet
1/2"	1,900 "
5/8"	4,500 "
3/4"	2,190 "
4/4"	72,250 "
5/4"	47,890 "
6/4"	31,720 "
8/4"	35,940 "
10/4"	19,140 "
12/4"	20,116 "
16/4"	16,088 "

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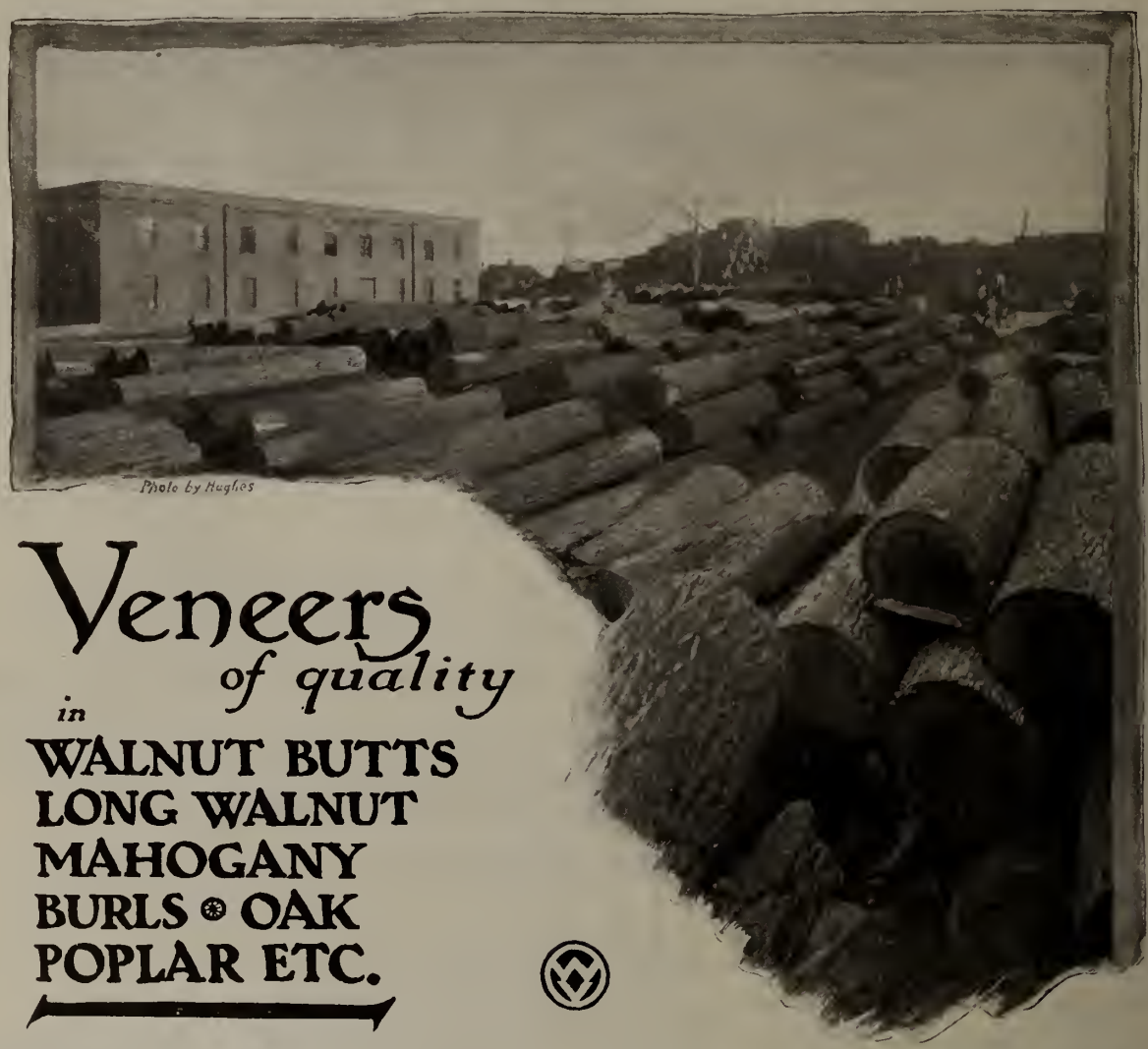

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Plain White Oak
Rotary Cut Gum

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The operations of the Wood-Mosaic Company function with precision because every step has been part of a well-conceived plan. The basic thought is a plant for each type of production. Thus, every foot of Wood-Mosaic hardwood lumber and veneers in walnut, oak and poplar is produced in a plant designed especially for the manufacture of each class of product.

This holds from the logs, which are the careful selection of a trained corps of twenty timber buyers, through the final operations of handling the manufactured product, special equipment having been provided for each unit of manufacture so that the lumber and veneer product may be always correctly dried and further prepared for consumer's use. We solicit the opportunity of demonstrating the value to you of such an organization.

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Casein Glue Durable in Damp Places

Casein glues are as a class more water-resistant than animal and vegetable glues, but they are not, strictly speaking, waterproof. There is no glue that is waterproof in the sense that it is absolutely unaffected by water after a long immersion. Nevertheless, there are casein glues that are so water-resistant that plywood glued with them will withstand soaking for many weeks in water or exposure for many months to a warm, damp atmosphere. Under similar conditions, animal and vegetable glues would lose their strength in a comparatively short time.

When casein glue joints are kept fairly dry, they con be expected to retain their strength and remain unchanged for an indefinite period, as is the case with animal and vegetable glues. Water-resistant casein glue in a joint, kept constantly wet, will after a long time weaken. but it will ordinarily regain a great deal of its strength if the joint is dried. In a study aimed to discover the reason why casein glues ultimately decompose when kept moist, the Forest Products Laboratory found that under certain conditions the decomposition seemed to be due to a hydrolysis of the casein, undoubtedly brought about by the sodium hydroxide that is always present in casein glues.

This explanation when published was misunderstood to some extent. It should not be taken to mean that casein glues are unreliable, and not durable enough for use in manufacturing plywood and other glued products. On the contrary, casein glues are considered as permanent as any under dry conditions, and the water-resistant casein glues are more permanent than animal or vegetable glues under wet or damp conditions.

Screw Holding Power of Plywood

If the screw fastenings in plywood construction are to be as strong as the plywood itself, it is important to adapt the size of screw, spacing, and margin to the particular species and thickness of plywood used. Tests made at the Forest Products Laboratory have shown that the commonly-used plywood species may be divides into the following groups. Those in any one group requiring the same screw fastener to develop maximum strength:

Group I—Low Density

Basswood	Douglas fir	Pine, white
Cedar, Spanish	Fir, true	Poplar, yellow
Cottonwood	Hemlork	Redwood
Cypress, bald	Pine, sugar	Sproce, Sitka

Group II—Medium Density

Ash, black	Gum, cotton	Mahogany
Ash, pumpkin	Gum, red	Maple, soft
Elm, white	Hackberry	Sycamore
Gum, black	Magnolia	Walnut, black

Group III—High Density

Ash, white	Birch	Elm, cork
Beech	Cherry, black	Maple, hard

The screw sizes, margin, and spacing for use with each species and plywood thickness will be found in the following tables. The gauge is the smallest that can be used with the thickness specified and not cause failure through breaking of the screw when the full strength of the plywood is developed. The length the screw is the shortest which will prevent the screw from pulling out before the full plywood strength is reached. The margin is the smallest distance from edge of hole to edge of plywood which will insure against failure by shear. The spacing is the distance from centre to centre of screw holes which gave maximum strength per linear inch.

About equally good results were obtained with flat-headed screws without washers and round-headed screws with washers. Round-headed screws without washers proved an inferior means of fastening. The spacing given in the table is for screws in a single row. but staggering is recommended wherever possible.

In the tests the size of frame members to which the plywood might be attached was necessarily a secondary consideration, and the block of wood in which the screw points were held was simply made large enough to prevent failure occurring in it. Until further information is obtained, designers must take particular care that the frame is not split or weakened through the use of the size of screw and the spacing necessary to make the fastening as strong as the plywood.

Size and Spacing of Screws for Maximum Strength in Plywood

Species of plywood	*Thickness of plywood in inches*	*Gauge (number) of screw*	*Screw length in inches — Species receiving point: White ash*	*Spruce*	*Margin in inches*	*Spacing in inches*
Group I	3/30	4	½	⅝	½	⅜
	3/24	5	½	⅝	⅝	½
	3/20	6	⅝	¾	⅝	½
	3/16	7	⅝	¾	⅝	⅝
	3/10	9	¾	1	¾	¾
	3/8	11	1	1¼	¾	¾
Group II	3/30	5	½	⅝	½	½
	3/24	6	⅝	¾	⅝	½
	3/20	7	¾	⅞	⅝	⅝
	3/16	8	⅞	1	⅝	¾
	3/10	10	1	1¼	¾	¾
	3/8	12	1¼	1½	¾	⅞
Group III	3/30	6	⅝	¾	½	½
	3/24	7	¾	1	⅝	⅝
	3/20	8	1	1¼	⅝	¾
	3/16	9	1¼	1½	⅝	¾
	3/10	11	1½	1¾	¾	⅞
	3/ 8	13	1¾	2	¾	1

Table giving data covering various woods

To Reduce Time and Cost of Air Seasoning

In co-operation with the sawmills and wood utilization plants throughout the country, the Forest Products Laboratory, Madison, Wisconsin, is organizing an extensive field study on the air seasoning of wood. This study, it is believed, will be of extreme interest to the lumber manufacturer and to the wood-using industries. The purpose is to determine the piling practice which will result in tht fastest drying rates consistent with the least depreciation of stock, the least amount of required yard space, and the least handling costs. The study will be carried on concurrently on both hardwoods and softwoods. All the important commercial woods of the United States will eventually receive consideration.

If you have a large number of screws to put into any class of wood, remember a machine will put them in five times as fast as a man.

Toronto Veneer Company Ltd.

1100-1104 Queen St. West - TORONTO

(Operating Panels, Limited, Southampton, Ont.)

ANNOUNCEMENT!

Our lumber department has been functioning satisfactorily for the past several months, but in order to better serve our customers we have opened a lumber yard in Toronto, and are yarding about 2,000,000′ of dry, band-sawn Hardwoods, principally Oak, Gum, Poplar, Chestnut, Walnut and Mahogany.

Thus equipped, we can make prompt shipment of mixed carloads of lumber, also lumber and veneers.

Following is a list of stock we have on yard in Toronto and in Transit:

24 cars 1″—2″ Plain White Oak
30 cars 1″—2″ Qtrd. White Oak
2 cars 1″ x 2½—5½″ Qtrd. White Oak
12 cars 7/16″ x 2½—5½″ Qtrd. White Oak
10 cars ⅝″—4″ Plain Red Oak
8 cars 1″—2″ Qtrd. Red Oak
2 cars 1″ Cherry
10 cars ⅝″—4″ Yellow Poplar
4 cars 1″—2″ Chestnut
8 cars ⅝″—5″ Northern White Ash
6 cars 1″—2½″ Hickory
8 cars 1″—3″ Plain and Qtrd. Red Gum
8 cars 1″—3″ Plain and Qtrd. Sap Gum
2 cars 1″ Tenn. Scented Cedar
2 cars ⅜″ and ⅝″ Mexican Cedar
8 cars 1″—2″ Mahogany
8 cars 1″—2″ Black Walnut

We have no lumber bought at peak prices to dispose of, therefore, our prices will be found to be right in line with the present Hardwood market.

Our Specialties: Soft-textured Indiana White Oak, Mahogany and Walnut

Office and Veneer Warehouse:
1100-1104 Queen St. West
Toronto

Lumber Yard:
Atlantic Ave. and G.T.R. tracks
Toronto

Are Veneer Prices Going Higher?

Recently a prominent shipper of southern hardwoods exhibited the price lists of his company for November, 1916, February, 1920, May, 1921, and August, 1921, which, in some of the items, at least, show what has been accomplished in the way of readjustment. The prices shown are for inch lumber delivered on a Chicago rate of freight.

	Nov. 1916	Feb. 1920	May 1921	Aug. 1921
Ash—				
FAS	$55	$185	$115	$90
No. 1 Com	40	150	65	50
Cherry—				
FAS	85	200	165	150
No. 1 Com	38	150	115	100
Red Gum—				
FAS	42	200	95	85
No. 1 Com	31	155	55	42
White and Red Oak—				
FAS	63	215	135	90
No. 1 Com	43	150	80	45
Poplar—				
FAS	60	200	125	105
No. 1 Com	38	150	80	45

Australian Woodworker Visits Winnipeg

Touring Canada for the purpose of studying lumbering methods, and especially with a view to inspecting woodworking plants in the West, R. C. Morrison of Morrison & Daniels, lumber dealers and woodworkers of Brisbane, Australia, was recently shown through the plant of the Radford-Wright-Wilson Company in Winnipeg.

As a practical woodworker, Mr. Morrison was greatly impressed with the high-class material turned out by the Radford-Wright Company, and congratulated that firm on the excellence of their products and also upon the general layout, cleanliness and equipment of the factory.

Morrison & Daniels is one of Australia's leading woodworking concerns, being capitalized at $1,250,000. They have extensive timber limits on which they do their own logging and cutting according to their needs. The company, in addition to the lumbering end of the business operates a large woodworking plant, but produces only doors, and these in the one size only, 2-8 x 6-8, turning out 2,000 a week at the present time, but expect to develop their plant in the near future to permit of this output being doubled, and also intend to increase their lumbering operations, with a view to opening up a large export trade with China and the Orient.

Commenting upon the methods adopted in the B. C. mills, Mr. Morrison was greatly struck by the sawing machinery, stating that in this respect Canada is far ahead of Australia, but is a long way behind the Commonwealth in respect to wood working and finishing machinery.

Canadian lumber men do not pay sufficient attention toward eliminating waste, was the opinion of Mr. Morrison. In Australia the woodworking plants sell every pound of shavings coming from the machines and also sell all the waste lumber which is used for firewood. Between these two by-products they manage to add a considerable sum to the profits of the business in the course of a year. All lumber used in Australia is naturally air dried. There is no such thing as a drying kiln in his part of the country. The more favorable climate and the absence of snow rendering artificial drying unnecessary.

Comparison of Lumber Prices

Lewis Thompson & Co., Inc., Philadelphia, Pa., were showing a very attractive line of plain and half round walnut and mahogany veneers in Toronto from August 27th to September 17th. The display included both plain and fancy stock.

J. H. Vaughan, who was in charge of their display, voiced the opinion that the present is the opportune time in which to stock up with veneers and hardwoods. The prices of his own line had been reduced to rock bottom and as a result many values were actually below replacement costs. This policy had been adopted in an endeavor to secure sufficient business to keep their plant operating and their organization intact. As soon as the demand showed any permanent improvement, prices were bound to go higher, for it would be suicidal for a firm to continue disposing of their output at a price below production costs. In this he only voiced the opinion of other hardwood men who are in close touch with market conditions.

A large number of furniture and piano men called and inspected the showing, some of them leaving nice orders. Mr. Vaughan found business better this trip than on any he had made during the past twelve months, and from this he judged that conditions in Canada were showing a slow but steady improvement.

Lacquer for Fumed Oak

It is claimed that an exceptionally attractive fumed finish may be obtained by using lacquer as a first coater instead of white shellac. This applies more particularly when using a stain finish. The use of the lacquer results in a depth of color and clearness which is not found when shellac is used.

WE HAVE A COMPLETE STOCK OF 3 and 5 PLY PANELS IN VARIOUS WOODS AND THICKNESSES FOR QUICK SHIPMENT

Also offer 3/8" 3 ply Fir s-2-s Panels for Drawer Bottoms and Backing.
1/8" Rotary Cut Northern Red Oak
1/8" Rotary Cut Northern White Oak.
1/8" Birch Veneer 6 to 36" wide 60 to 86" long.
Panels also made to your dimensions.

Write for Prices

GEO. L. WAETJEN & CO.
Milwaukee - Wisconsin

100% EXCELLENCE

Manufacturing
High Grade ROTARY CUT VENEERS
Specializing BIRCH DOOR STOCK,
MAPLE PIANO PIN BLOCK STOCK

Years of Experience Behind Our Products

The Munising Woodenware Co.
MUNISING, MICH.

Walnut, Quartered White Oak and Mahogany Veneers and Lumber

Prompt Delivery

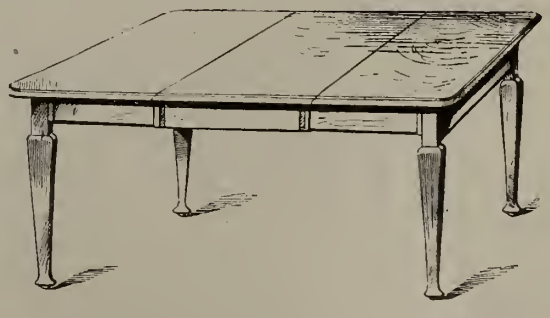
LONG-KNIGHT LUMBER COMPANY
INDIANAPOLIS, IND.

VENEERED TABLE TOPS

WALNUT - MAHOGANY - QUARTERED OAK

PROMPT delivery in any quantity at very attractive prices. Just let us know your requirements and we shall be glad to forward quotations.

Panels are made in Walnut, Quarter Oak, Birch, etc. Large sizes (72x24; 60x30; 60x24; 56x25; 60x20; 60x18; 48x18) carried in stock at all times.



HAY & CO., Limited Woodstock, Ont.

Not Behind Anonymous Campaign

American Walnut Manufacturers' Resent Propoganda Being Carried on in Favor of this Wood—Have Always Conducted Dignified, Legitimate Publicity Work

We have recently had called to our attention certain propaganda, apparently issued from Cincinnati, relative to the use of substitutes in walnut and mahogany furniture.

This propaganda has apparently been issued anonymously, and we are unaware as to the identity of the instigators. The propaganda ostensibly is the individual act of some salesman of walnut and mahogany lumber. It consists of sending out the letter to manufacturers of lumber, presumably those producing walnut and mahogany. The letter encloses a printed slip, which it is suggested be mailed to furniture retailers in whose windows has been seen furniture labeled as walnut or mahogany, but in reality made largely of some substitute wood.

The letter is written on plain paper with nothing to indicate either its origin or the author, and is as follows:

Type of Letter to Manufacturers

I am a lumber salesman selling Walnut and Mahogany on the road and the house I represent is adverse to adopting any new ideas, and because of this fact I am afraid to submit my little plan to them, but have selected a few firms whom I know to be progressive and herewith ask you as one of them to please cooperate.

It is my humble opinion that the substitution now going on of Birch and Gum could be stopped almost entirely in thirty days' time, if we fellows on the road go after them right.

My idea is to have you give some of the enclosed slips to one or two of your discreet salesmen and ask them every time they see Gum or Birch furniture in a store window, that they jot down the storekeeper's name and address and when they get back to the hotel or office they simply mail the said storekeeper one of the enclosed slips, and at the same time it would not be a bad idea to send the names and addresses to the Mahogany and Walnut Associations and the next time the said salesman passes the retailers' stores he should notice if they still have Gum or Birch in their store windows.

You understand no signature shall be put on the slip and the same simply to be mailed in a plain envelope, and as far as sending in the names and addresses of the storekeepers to the Lumber Associations, this is just a suggestion, because I firmly believe, as an old traveling salesman, the retailers will cut out this faking twenty-four hours after they get notice, then we salesmen will send in orders as well as lists of traveling expenses.

My theory is that at least ninety-nine out of a hundred will stop stealing if they find out some one has actually caught on. The idea of a serial number is to make the warning look official, and in the case of duplication the retailer will take it as a second notice. Yours very truly, A HARDWOOD LUMBER SALESMAN.

Reproduction of Circular

"FRIENDLY WARNING"

Furniture made of Gum or Birch spotted in your show window today.

Am sending this word in, and possibly a test purchase will be made to see if your salesmen will represent the furniture as Walnut or Mahogany, instead of imitation.

This notice is sent to give dealers laboring under a wrong impression time to consult their attorneys and correct any misrepresentation if they be guilty.

Notice A No. 882 ADVANE AGENT

Actual samples of the slip entitled "Friendly Warning" are also enclosed. The numbers are consecutive on each different slip, and there seems to be a series of notices designated by various letters of the alphabet.

In view of the fact that this Association has for several years been conducting a dignified, legitimate and responsible publicity campaign in the interests of American Walnut, we wish to have it be definitely known that we are not responsible for this or any other propaganda unless it is issued under our name and carries with it our copyrighted design, "American Walnut."

While we freely admit that there has existed in the furniture industry a situation, perhaps developed largely through war conditions, that is unsatisfactory, in the matter of the use of substitutes in furniture supposed to be of high class cabinet wood, nevertheless it is our firm belief that this is a situation which is righting itself through the efforts of the furniture manufacturers and the furniture retailers. It has been our observation that the furniture industry is anxious to take such action as will give it the entire support of the public and we consider such propaganda as mentioned above extremely illadvised and since walnut is mentioned specifically we wish to take this occasion to announce that we have had nothing whatever to do with it, and furthermore, it has our entire disapproval.

The American public is thoroughly familiar with the superior qualities of American Walnut as a cabinet wood and is using it for furniture and interior trim to a degree as never before known. We are fostering in every way possible the use and respect for this supreme cabinet wood, but we are doing it in a legitimate and regular manner, and all of our advertising will show definitely its origin.

We should appreciate your courtesy in giving this matter the publicity that we believe the situation requires. American Walnut Manufacturers Association, G. N. Lamb, secretary.

Unusual Carving on Exhibition

A wood carving descriptive of the life of Christ on which five monks worked for fifteen years has been placed on exhibition in New York. The carving, valued at $125,000, was brought to the United States by one of the monks who made it in the monastery at Mount Athos, Macedonia.

The composition is 28 inches high and 23 inches wide, and includes several hundred figures in high and low relief. The central picture is "The Last Judgment," reproducing in wood the detail of Michael Angelo's famous painting.

The modern boring machine is now made to bore all the holes in a piece of wood at one operation.

Adverse Conditions Have Not Affected the Quality of Our Lumber or Service

AT ONE POINT in the development of a modern busines its driving force may keep it going brilliantly while conditions are favorable. Later it gains a solidly established state, imparting a degree of momentum sufficient to maintain the forward movement even under the most trying circumstances.

So with the Anderson-Tully Company, pioneer manufacturers of Southern hardwood lumber, veneer and plywood. Great diffculty in operation has in no way impaired our ability to serve you correctly. The Anderson-Tully Company trademark will always be known where the best in goods and service are most appreciated.

Order from Anderson-Tully on present low prices

ANDERSON-TULLY COMPANY
MEMPHIS

LIVEZEY

News of the Trade

The Young Lumber Co., North Bay, Ont., recently purchased a C.M.C. hardwood flooring machine.

The carriage factory operated by Thomas Young at Millsville, N.S., was completely destroyed by fire. The loss amounts to $50,000.

Marlatt & Armstrong, Limited, Oakville, Ont., leather tanners, recently installed a new C.M.C. moulder and a new C.M.C. matcher.

The contract for the millwork for the Isaac Brock School, Winnipeg, Man., has been awarded to Brown & Rutherford, Winnipeg.

The Langmuir Mfg. Co., Limited, Toronto, manufacturers of trunks, have added a new Whitney planer to their woodworking plant.

Joseph A. Likely, Limited, Rothsay Ave., St. John, N.B., is in the market for a large band resaw capable of handling material as large as 14" square.

The Simpson planing mill and lumber yard, foot of Spadina Ave., Toronto, was recently damaged by fire. The loss amounts to about $8,000. The cause of the fire is unknown.

The Woodstock plant of the Kirsh Mfg. Co. of Sturgis, Mich., was recently put in operation, the product to include curtain rods, rings and articles for use in the draping of windows.

Cushing Bros. Limited, Regina, Sask., have received the contract for the millwork for the new Lakeview School, which is being erected in Regina at a cost of $112,000.

The British Columbia Wood, Wool & Fibre Products Co., Limited, 679 Granville St., Vancouver, B.C., were recently incorporated with a capital of $25,000., to manufacture wood wool under the McMillan patent.

The Montreal Home Builders Co. are being organized with a capital of $400,000. to enter upon the construction of low-priced houses. Their address is 295 St. Catherine St. West, Montreal.

Jacob E. Herr recently passed away at his home in Stratford, Ont., after a brief illness. The late Mr. Herr was in his 66th year and for many years had been foreman in the Kalbfleisch Planing Mill.

The Modern Home Builders, Limited, Windsor, Ont., have purchased the planing mill and sash and door factory formerly operated by George A. Haugh. This business is to be conducted under the name of the Haugh Lumber Co., Limited.

The Western Mfg. Co., Limited, Regina, Sask., have received the contract for the new $100,000. college being erected at Regina by the Campian College. In this connection the school furniture and fixtures will be purchased by Rev. Father Leahy, Campian College, Regina, Sask.

The Montreal Boatbuilders, Limited, Montreal, P.Q., were recently incorporated to construct, repair and deal in boats, barges and pleasure craft of all kinds; capital $100,000. W. S. Johnson and A. R. Hall of Montreal are two of the incorporators.

C. B. Allen of the Allen-Eaton Co., veneer and panel manufacturers, Memphis, Tenn., has been chosen to represent the plywood panel industry on the Hoover Conference Board. This board meets monthly in Washington in the interests of general business. Mr. Allen is first vice-president of the Plywood Manufacturers Association and takes an active interest in the work of this organization.

W. G. Durst, manager of the Chesley Furniture Co., Chesley, Ont., together with John Hauser, foreman of the plant, were in Toronto recently attending the exhibition.

Messrs. Radford-Wright-Wilson Co., Limited, Winnipeg, Man., have received contracts for the millwork for the following buildings:—Mountain Ave. School, Winnipeg, Man.; Medicine Building, University of Manitoba, Winnipeg.

The Sidney Sawmills, Limited, Sidney, B.C., have taken a contract from the DeLaval Cream Separator Co. for a large quantity of silo staves. Most of these silos are being disposed of in the Ontario market, the eastern factory of the DeLaval Cream Separator Co. supplying the necessary iron parts.

In a letter to the "Toronto Globe" H. E. Mihell of the Imperial Varnish & Color Co., Windsor, Ont., denies that paint and varnish manufacturers are maintaining war-time prices for their products. He maintains that the total reductions in the wholesale price of paints and varnishes have amounted to 23½% in the last eight months.

The plant of the Matthews Sash & Door Co., Fort William, Ont., was recently damaged by fire. While the loss is considerable and covered by insurance, the operation of the plant was only interfered with for being erected in Winnipeg by Gunnell & Higgins at a cost of $65,000., has been awarded to the Dowse Sash & Door Factory, St. Boniface, Man.

Robert Stewart, Limited, Guelph, Ont., are inviting tenders for the construction of a new woodworking factory at a cost of $40,000. This is to replace the plant recently destroyed by fire. The new building is to be two storeys, 100 x 175, and of mill and brick construction. It is understood that all the machinery for this new factory has been purchased.

Shaw & Son, Collingwood, Ont., contemplate establishing a woodworking plant in that town. An agreement has been entered into with the town council whereby certain lands were deeded outright to the above firm and others were leased. A fixed assessment of $1,000. a year has been granted for a period of five years.

Wilders, Limited, Montreal, P.Q., have been incorporated to manufacture and deal in household furniture of all kinds and to conduct a general merchandising business; capital $500,000. H. K. Hemming and J. A. Black, public accountants of Montreal, are two of the incorporators.

The Arcadian Phonograph Co., Limited, Toronto, has been incorporated to manufacture and deal in phonographs and musical instruments. Capital $40,000. J. H. Young and L. J. Brown of Toronto, are two of the incorporators.

J. A. Pyke, a well-known Montreal designer and builder of motor boats, was instantly killed when a motor boat belonging to G. B. Clark of the A. R. Clark Co., Toronto. The accident occurred following a race in front of the Exhibition Grounds when the boats were banking in an effort to reduce their speed.

Chas. A. Brockbank of the Concord Piano & Player Piano Co., 81 King William St., Melbourne, Australia, was in Toronto recently purchasing equipment and supplies for his firm. He placed orders with some of the local piano action manufacturers for a number of actions, and some of the Canadian machinery firms

A Minute a Day——

It isn't much, but if considered in the light of waste is a mighty important factor in every business. Let's figure it out and see what it amounts to in a year.

If one employee is a minute late each day—either morning or noon—he loses six minutes a week, or three hundred and twelve minutes a year, or 5 1/5 hours. The average workman will perhaps earn 75c an hour. You therefore pay $3.90 for which you do not receive the labour you have purchased. On this basis, with fifty employees, it will amount to $195.00, and with a hundred employees, $390.00 a year.

We have taken the minimum of lost time, but it is conceded that with unprotected pay-rolls the average loss is five minutes per man per day.

Is it not worth a few moments' time to drop us a letter requesting further particulars about the INTERNATIONAL TIME RECORDERS—the accurate, legible, and unchangeable watchman of your pay-roll? Which are used by

THOUSANDS of Canada's most successful firms—why? Above is the answer.

International Business Machines
SPEED ACCURACY ECONOMY

International Business Machines Co.
LIMITED

F. E. MUTTON, Vice-President and General Manager

Head Office and Factory: 300-350 Campbell Avenue, Toronto

HALIFAX, 44 Granville St. ST. JOHN, 29 Dock St. QUEBEC, 506 Merger Bldg. MONTREAL, 1 and 3 Notre Dame St. OTTAWA, 190 Queen St. TORONTO, 409½ Yonge St. HAMILTON, Room 8, 36 James St. S. LONDON, 489 Richmond St. WALKERVILLE, 44 Lincoln Rd WINNIPEG, 227 McDermott Ave. VANCOUVER, 230 Cambie St. SASKATOON, 254 Third Ave. S.

Also manufacturers of International Dayton Scales and International Electric Tabulators

were favored with orders for equipment. Mr. Brockbank stated that he had no idea that such high-class woodworking equipment was being manufactured in Canada. His only regret was that he had not visited this country first, as in coming through the United States, he lpaced orders there for a considerable volumd of equipment.

John J. Knight was suffocated recently in the shavings vault of a Hamilton planing mill. Mr. Knight evidently climbed in the bin to loosen the shavings when he was buried and could not extricate himself.

The Gove Motor Car Co. recently broke ground for their new plant, which is being erected at Thorold, Ont. A car known as "Falcon Light Six" will be produced.

The Valley City Seating Co., Limited. Dundas, Ont., recently exported a large consignment of church furniture to Hendrina, Transvaal, South Africa. This order included pews and other items in church furniture.

A catalogue has been received from the Luster-Jordan Co., Inc., Norristown, Pa., covering their line of lock-corner wood box machinery. This includes equipment for cutting the lock corners, gluing, assembling, squeezing and trimming the corners. Many of these machines are automatic.

Reitzel's Limited, Waterloo, Ont., were recently incorporated to manufacture and deal in furniture of all kinds and to take over as a going concern the furniture manufacturing business formerly conducted by Reitzel Bros. Capital $125,000.

W. H. Shaw, Toronto, who has contributed many articles for the columns of the "Canadian Wood worker and Furniture Manufacturer," was in charge of the woodworking exhibt made by the Buyer's Door & Manufacturing Co., Limited, Toronto, formerly Batts, Ltd.

The Cincinnati office of Mowbray-Robinson Co.. hardwood lumber manufacturers, was recently destroyed by fire. The loss, which amounts to $5,000., is covered by insurance. The blaze was confined entirely to the office building, none of the lumber in the yard being touched.

S. Lower, Quebec, recently passed away at his home after a brief illness. The late Mr. Lower had conducted an upholstering establishment in Quebec for the last half century and was honored and respected by all who came in contact with him. He was in his seventieth year.

The hardwood lumber mill and stock of hardwoods belonging to George Mason & Co., Midland, Ont., was recently destroyed by fire. More than 600,000 feet of hardwood and several hundred thousand hardwood broom handles went up in flame. It is probable that the Mason Company will rebuild their plant. In the meantime seventy men are thrown out of work.

The Parker Motor Car Co. of Montreal, capitalized at $10,000,000., have completed arrangements with Caron Bros. whereby they will secure sufficient space in the Longue Point Works to provide for assembly, on a large scale, of the company's new car, known as the "Royal Six." Production will likely be in the neighborhood of 4,000 cars per year.

John M. Kilbourn, one of the pioneer industrial leaders of western Ontario, recently passed away at his home in Owen Sound, Ont. He was connected with numerous well known manufacturing organizations, among which might be mentioned the North American Furniture Co., Limited, and the National Table Co., Limited, both of Owen Sound. Mr. Kilbourn was born at Smith's Falls in 1848 and moved to Owen Sound in the early sixties. His sterling qualities won the esteem and respect of a wide circle of friends and business associates.

The Rice Lake Canoe Co., Limited, Cobourg, Ont. which is affiliated with Langslow, Limited, furniture manufacturers, have decided to enlarge their canoe factory. A new addition 155' x 55', two storeys high is contemplated. In all probability sufficient equipment will be installed to make this plant independent of the furniture factory. At the present time practically all the millwork on canoe stock is done in the latter plant

The Boake Mfg. Co. Limited, are making a few changes and improvements in their plant. They are installing two new boilers, an American No. 77 fast feed matcher, two American No. 26 moulders and a Preston power feed rip saw. Some time ago they equipped their transmission line with Chapman double ball bearings. When the new installations are complete they will be able to take care of an increased volume of business.

W. C. Durant, founder of the General Motors, Limited, of U.S. and Canada, recently completed a deal whereby he secured the Leaside Munitions plant. He will use this for producing the Durant car which is just being placed on the market. Plans call for a capacity of 100 finished cars a day. In this connection a complete woodworking plant for the manufacture of automobile bodies will be installed. At the present time the Durant car is being manufactured at Flint Mich., and it is anticipated that the Canadian plant will be producing by March 1st.

The Canadian Gary Motor Truck Co., Limited, were recently incorporated with a capital of $250,000. to manufacture and deal in automobiles, motor trucks and vehicles of all kinds. This firm has purchased the buildings of the Chase Tractor Co., Limited, situated at 28 Atlantic Ave., Toronto, and will recognize this plant for the production of their line of motor vehicles. This is the Canadian branch of the American Gary Co.. Gary, Ind., of which Frank Dawson is president and Theodore Zumstein is vice-president and sales manager.

The Frank A. Conkling Co., Memphis, Tenn., dealers in Southern hardwoods, have completed arrangements whereby they handle the sales of Alexander Bros., Belzoni, Miss. This latter firm operate mills at Junks, La., Belzoni, Miss., and Memphis, Tenn., and cut nothing but Southern hardwoods specializing in soft-textured red gum, plain and quarter sawn, cypress, oak, ash and elm. The production of these mills, together with the output of the Conkling mills at Percy and Issaquena, Miss., give the Frank A. Conkling Co. a daily production of 160,000 feet, enabling them to increase the efficiency of their service to the consuming trade.

George H. Brown, who is connected with the Knechtel Furniture Co., Limited, Hanover, Ont., was the winner of the wood-guessing contest recently conducted by J. A. Fay & Egan Co. of Cincinnati, Ohio. This firm published untouched photographs of a number of samples of wood and offered a prize for the person who could come nearest naming all the kinds of wood shown.. Mr. Brown was able to name four correctly, and out of all who tried, he was the only one who was able to submit this number of correct replies. The woods shown were as follows:—white cedar, red cedar, Queensland kauri pine, crow's ash, silky oak, blue gum, iron bark and tallow wood.

In the August "Canadian Woodworker" we reported that the furniture factories at Stratford had resumed operations on a comprehensive scale. Now

One Reasan why Kraetzer Cured Gum is Straight and Flat

Kraetzer-Cured Gum

THE ONLY KIND THAT IS ALWAYS BRIGHT, STRAIGHT AND FLAT

Kraetzer-Cured Gum does not "work" after being made up into furniture. It does not warp or open at the joints, or check in panels in the way that other less scientifically handled lumber does.

If you have used Kraetzer-Cured Gum, you know this already. If not, you owe it to yourself to find out about this super hardwood.

This "quality product" does not happen by chance. One reason is that Kraetzer-Cured Gum is steamed in the Kraetzer Preparator. Then every board is carefully graded, the sticking is scientifically and perfectly done, every stack is side ventilated, is elevated, and every pile is on wheels. Then, to begin with, remember that Kraetzer-Cured lumber is made from large virgin timber of exceptional quality.

Besides Gum, we have Oak, Ash, Tupelo, and Cypress of a quality that is unsurpassed.

Write us today for the reasons why Kraetzer-Cured lumber is *different* and *better*. We guarantee every board.

Our Protection

THE KRAETZER-CURED LUMBER CO.

Your Guarantee

The Kraetzer-Cured Lumber Co.

GENERAL OFFICE: GREENWOOD, MISS.

Band Mills: Greenwood, Miss., Moorhead, Miss.

comes the report that the large Woodstock plant of the Canada Furniture Manufacturers, Limited, has resumed production. The Beach Furniture Co., Limited, Cornwall, Ont., have adopted a full-time schedule, calling for 55 hours a week, 10 hours per day for 5 days and 5 hours Saturday. The management of the latter company report that the prospects for fall business are very bright. This firm recently opened warehouses in Western Canada and in the United States.

The plant of the Preston Car & Coach Co., Preston, Ont., has been taken over by the Canadian Brill Co. It is the intention of the new concern to make this plant the largest car works in Canada. The Canadian Brill Co. have many orders booked, one of which is for $400,000. and must be completed by January 1st, 1922. This means that the output of the plant must be increased and the staff enlarged. It is expected that about 400 men will be at work by the 1st of October and by the first of the year this number will have been increased to 600.

Among the pianos on display in the booth of Heintzman & Co., Limited, at the Canadian National Exhibition is to be found the $3,000. piano which has been constructed to the order of Tetrazzini, the well-known operatic singer for her own use in her castle in Rome. This piano is in florentine design with carved legs and is finished in ivory white, the mouldings being tipped and finished in gold. It has taken nearly a year to complete this instrument. The fact that, after using pianos made by practically all the well-known manufacturers, Tetrazzini should place an order with a Canadian piano maker, is an unmistakable compliment to the quality of the product of Canadian plants and to Heintzman & Co. in particular.

George Dobson, Vancouver, B.C., western representative for the McLagan Furniture Co., the Stratford Chair Co. and other Stratford firms, was killed recently in an auto accident just outside Kelowna, B.C. It appears that a party consisting of the deceased, Harry J. Godfrey of Vancouver, salesman for Simmons, Limited, Hugh McLaren, manager of the B. C. branch of Simmons, Limited, together with Mr. McLaren's young son, Hugh H. McLaren, aged 7, were on a business trip and while motoring between Kelowna and Summerland, the car became unmanageable when crossing a bridge, and breaking through the light railing, crashed to the bed of the creek some 70 feet below. The driver, George Dobson, was instantly killed and Mr. McLaren's son fatally injured, dying some hours later, while Mr. McLaren and Mr. Godfrey received rather serious injuries. It is thought that the accident was due to the steering gear of the car breaking.

Mistakes in Building Church Organs

Each year hundreds of churches are installing new organs. Some of them are musically disappointing, while others, being poorly constructed, soon require repairs more or less extensive and are a continual source of expense and annoyance because of mechanical derangements. A first-class organ should be a continual satisfaction from the day of its installation, and, under ordinary conditions, should not require any repairs except minor adjustments and periodical tuning for at least ten years. Where organs are not satisfactory, the trouble is not always because unscrupulous builders have been selected and allowed to follow their own desires; frequently the ignorant organ-purchasing committee, or organist, are responsible for a dubious scheme which a conscientious builder should refuse to accept.

Do Your Mouldings Match?

The above heading was taken from an advertisement in a large woodworking and lumbering paper. The advertisement went to ask,—Do all the mouldings of the same catalogue number in your stock match exactly for size and shape, or do they make a very poor butt joint? Stocks bought at different times from different times from different mills, and sometimes from the same ill, often show a wide variation in size and contour. This is the result of regrinding moulder knives without preserving their exact shape. Keeping up these cutters is a job for an expert. Errors in profile will grow, almost unnoticeably, with each grinding until the size and shape of the moulding is entirely changed. Our line of mouldings and matched items is manufactured to a standard. Mouldings, sidings and flooring run true to shape and dimension. This is one of the final points of lumber merchandising that counts for so much nowadays.

Does this not point out the weakness of present methods under which mouldings are run to a variety of sizes and designs, and is it not in line with the idea of adopting standards for millwork of all kinds as advocated in recent issues of the "Canadian Woodworker and Furniture Manufacturer?"

$30,000,000 in a Chair

In the Shah's palace at Teheran may be seen the celebrated Peacock Throne, valued at more than $30,000,000. It was taken from the Grand Mogul at Delhi by the victorious Nadir Shah. It is in many ways a curious and wonderful article, virtually a single chair, upon which the Shah sits when he holds diplomatic receptions.

The wood is of the finest evony, and most elaborately carved, and ornamented with sheets of gold on which are enamels, fantastic birds, and chimeras set with precious stones, culminating in a diamond sun.

Pipe Makers Using Birch

Canadian birch since the war has acquired a South American name. Nowadays it is fashioned into pipes and then called something besides birch. The only evident reason for the change seems to be the fact that the process that converts the soft birch into a hard pipe was originated in a Latin-American country, according to the New York Evening Sun.

Birchwood owes its new name and its present prominence in the pipe industry to the war, which cut off the supply of briar and sent the prices of stocks in America sky high.

Substitutes have been sought for the expensive imported briar. The cessation of importations with the war—they haven't resumed yet—intensifies the search for an American wood that would provide a suitable substitute.

Many native hardwoods were tried without success. Most of them weer either too hard to be worked into pipes, or too heavy to rest comfortably between a smoker's lips. Then some one hit upon the expedient of trying a softer wood and employing a process that would give it the required hardness for use in pipe manufacturing. Birch was found the most suitable for the purpose.

Machine manufacturers are now making sanders for all kinds of work. It is difficult to find the job which cannot be sanded by machinery.

Canadian Hardwoods

Good Stocks
Right Grades
Prompt Shipments

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TORONTO, CANADA

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3	cars	5/4	in.	no. 2 Com. & Btr. Basswood
1	cars	6/4	in.	no. 2 Com. & Btr. Basswood
2	cars	6/4	in.	no. 2 Com. & Btr. Birch
2	cars	8/4	in.	no. 2 Com. & Btr. Birch
2	cars	12/4	in.	no. 1 Com. & Btr. Birch
5	cars	4/4	in.	no. 2 Com. & Btr. Maple
2	cars	8/4	in.	no. 2 Com. & Btr. Maple
2	cars	12/4	in.	no. 1 Com. & Btr. Maple

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Lumber, Lath and Box Shooks

General Woodworking Trade Mart

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Equipment Materials Employment

GOOD VALUES

Subject to Prior Sale

These are only a few of our stock

Moulder, Hermance 8 and 10 in., 4 side.
Moulder, Woods 10 and 12 in. inside.
Moulder, American 10 in., 4 side.
Sander, endless bed 48 in., H. B. Smith.
Belt Sander, Curtis No. 20.
Sander, Moore Machine Co., belt.
Matcher, American No. 229 fast feed hardwood flooring.
Band Resaw, Connell & Dengler 60 in.
Band Resaw, Mershon 44 in.
Band Rip Saw, Fay & Egan No. 202 chain feed.
Circular Saw Mill, Hoosier Pony.
Circular Resaw, 44 in. heavy type.
Jointer, Falls Machine Co., undercut 24 in., power feed.
Buzz Planer, 16 and 24 in.
Lathe, Back Knife Clement 40 in.
Planer, 30 in. Fay &Egan Single Cabinet.
Dowell Machines, Hay and Fay.
Dowell Gluer and Driver, E. B. Hayes.
Door Clamp, Hayes Standard Power.

Woodworking Machinery Company of Buffalo,
54 Mechanic St.,
Buffalo, N.Y.

FOR SALE

Box-Board Printer, 18 x 44 in. Connell & Dengler, Two Color, Chain Feed, $950.00.
Moulder, 4-side, 10 in. American, $700.00.
Double Cut-off Saw, Automatic, Berlin No. 229, $775.00.
Band Resaw, 54 in. Berlin, with 3 saws, $1,100.00.
Slab Resaw, Fischer Little Giant, $375.00.
Railway Cut-off saw, S. A. Woods, No. 190, $200.00.
Box Groover, Chase-Turbine, No. 245 Automatic, $300.00.
Nailing Machines, Morgan and Doig, all sizes.

Chas. N. Braun Machinery Co., Fort Wayne, Ind., U.S.A. 7-8

For Sale

1—15″ Head Matcher
1—12″ Moulder
1—Embossing Machine
1—Spiral Rope Machine
1—Sander
24″ wide 6 ply Leviathan Belting

A large number of pulleys and some shafting.
Write for a full list.
All material at very reasonable prices.

Gold Medal Furniture Mfg. Co., Toronto 9-10

Woodworking Plant

For Sale or To Rent

Manufacturers in good lake town, north of Toronto, making products of wood and iron, are discontinuing the wood lines and their woodworking shop with all or part of the machinery and equipment is for sale at a low rate on the dollar, or for rent at a low rental for a year or two, with option of purchase. Building is a separate unit, modern concrete mill construction, 50 ft. x 100 ft., two stories, complete with machinery, 200 h.p. steam plant, belting, shafting, shaving exhaust system, dry kilns, elevators, plumbing, electric wiring, two railway sidings, large yard, etc., ready to step into for immediate operation. Hydro-Electric power will be available shortly. Box 111, Canadian Woodworker, Toronto, Ont. 9

FOR SALE

New Time Recorder, numbered to 100; never been used. Apply Box 113, Canadian Woodworker, Toronto. 7-9

FOR SALE

Dovetail Box Machinery (St. Paul), complete set, good condition, cheap. J. L. Neilson & Co., Winnipeg. 8

FOR SALE

Dowel and Skewer Machinery, also a couple of engines. Box 112, Canadian Woodworker, Toronto. 7-9

Wanted

Two No. 9 Nailing Machines, Morgan preferred. Apply Salada Tea Co., 461 West King St., Toronto. Phone Adelaide 4930. 9

Skid Construction Machinery on Track

In assembling the plant for constructing the Hetch-Hetchy Dam for San Francisco it was occasionally necessary to move motors weighing several hundred pounds from one part of the job to another. Particularly on short hauls, it hardly seemed worth while to raise the motors to flat car level and then lower them to track level again. A means adopted to avoid this consisted of putting a motor on a pair of skids and moving it as a sled to a position on the industrial track with the skids at right angles to the rails, and then dragging it along the rails by means of a chain to the contractor's dinkey. Care was taken to see that the end of the skids which projected over the rails would clear any obstructions that might be met with along the track.

BARGAINS

We warrant the following used and rebuilt Wood Working Machines.

1 Woods 15 X 6″ Planer & Matcher.

1 MacGregor 26 X 8″ Double Surfacer.

1 Yates 30 X 6″ Double Surfacer (rebuilt)

1 Smith 8″ Sticker.

1 RogersNo. 6 R.H. Saw Sharpener (new)

1 Black Diamond No. 1 Saw Filer (new)

1 Jackson Cochrane 3 Drum Sander

1 MacGregor Mortiser

1 C.M.C. Sash Moulder 6″

1 C.M.C. 12″ Buzz Planer

1 MacGregor Tenoner

1 Woods 24 X 6″ Planer & Matcher

1 Smith 10″—4 side Moulder

1 New Britain Chain Mortiser

1 Greenlee Hollow Chisel Mortiser

1 Morgan No. 8—26″ Nailing Machine, open back

1 Jackson Cochrane 12 spindle Dovetailer

1 Cowan 12″ Buzz Planer

1 Bertrand 18″ Buzz Planer

We solicit your inquiries.

Write or phone for description and price

M. E. Casey Co.
Limited
263 St. James St. Main 411
MONTREAL

WITH ALL THY GETTING, GET UNDERSTANDING

By C. B. HARMAN, Secretary Southern Sash, Door and Millwork Manufacturers' Association.

We had a personal letter April 29th from B. C. Forbes, the magazine writer, and at the top of his letterhead we found the above staring us in the face. Mr. Forbes, in making reply to a communication from our office, with these six little simple words has given us a thought which we are now passing on to the millwork fraternity with the sincere hope that these same six words will burn themselves into the memory of every one.

Refer to the title and read again, "With All Thy Getting, Get Understanding"—no more was ever said with as few words, nothing whatsoever is needed by the business man (the manufacturer especially) as "understanding."

We find in Webster's dictionary, "Understanding" defined as follows: "Knowledge, perception, agreement, explanation, belief, sense, reason."

A business man of understanding, of knowledge, belief, sense and reason is equipped "to the teeth" with the best weapon on earth. He knows when and where to start and exactly when and where to stop.

The business man of understanding must of necessity have a knowledge of the cost of that which he must price at a profit. He believes that his cost is correct, has sense enough to let the other fellow take an order when below his cost or when it does not afford him a fair profit and has sufficient reason to see that it is the correct and best thing to do.

The business man without understanding, of a consequence has no knowledge of his cost, has no knowledge that he does not know his cost, but believes that he does. He also believes that his competitors are after his goat and believing that his business is so different than any other, he is without sufficient sense and reason to let up on an order when the figures begin swimming and floating about near and around the "sucker hole."

Now, then, just after reading Mr. Forbes' letter, along comes another, which "sot" us to thinking, and we have been thinking ever since. It read something like this:

"————————, N. C., April 22, 1921.

"We were requested a few days ago to make a price on a lot of window and door frames with inside trim and were awarded the order at $870.00. Others figures submitted were: Factory No. 2, $895.00; factory No. 3, $920.00.

"We booked the order and were preparing to bill it into the factory when we got a letter from the customer cancelling the order, stating that another factory, No. 4, had agreed to furnish the same material for $475.00, or about 45½ per cent. less than our price of $870.00, which was only $25.00 less than the next lowest bid and $50.00 lower than the highest bid."

We are still thinking—the uppermost thought being, How can the first three factories have the nerve to charge such outlandish prices? We are also wondering just how much factory No. 4 will really make on the transaction.

And finally the biggest thought of all is in a fact, and that is, neither of these four factories have any well defined system of cost keeping, all four bids were purely guesses or approximations.

"With all thy getting, get understanding."

The
Sidman
Lumber Curing Kiln

Ask any user if it is not
The Satisfactory Kiln

Designed to suit your individual need.

Lowest first cost per M. of dried lumber.

Lowest cost for operation and upkeep.

Made in Canada
No Exchange or Duty

WATCH
this space in October

The Sidmans of Canada

Lumber Curing Specialists

LONDON ONTARIO

Information and Inquiries

You are cordially invited to make use of this department

Disposal of Wood Waste

Weedon, P.Q.,
July 27th, 1921.

Editor, Canadian Woodworker,

I noticed in a recent issue of the "Canadian Woodworker and Furniture Manufacturer" that there is a market for sawdust shavings and other forms of wood waste. We find that in the manufacture of dowels and rods that a considerable quantity of this material accumulates. Could you offer any suggestions that might aid us in finding a profitable market for this waste.

Yours truly,
Marcel Despres.

In nearly every case the market for such material must be worked up locally. In almost every village or town there is a certain demand for shavings and sawdust, either for bedding, packing purposes as a floor covering for butcher shops or for filling wall spaces in houses and other buildings. It is just by going after such small openings as these that a permanent market can be developed. Wood waste in the form of edgings and trimmer blocks should find a real sale as a fuel.

There are many small articles, particularly in the toy line, which could be made from small pieces of wood, but unless the market for such a product is large enough to warrant a large production and special equipment, it is doubtful if wood waste could be worked up at a profit.

If you have a baling press you may be able to find a market for a certain amount of shavings at a distance. We know of several instances where local planing mill operators haev shipped carloads of baled shavings across the line. The price is small, being in the vicinity of 25c to 30c a bale, but at that, it more than pays handling expenses.

Staple Driving Machine

Saskatoon, Sask.,
August 24th, 1921.

Editor, Canadian Woodworker,

Can you advise me if there is any machine on the market for driving staples in wood slats, which are attached to the canvas on binders? What we had in mind was an electrically-operated machine. Any information along this line will be appreciated

Sincerely yours,
L. W. Ross.

We do not know of any machine made specially for this purpose. If any of our readers can enlighten us on this subject, their co-operation will be appreciated.

Desirous of Handling Canadian Furniture

A large Jamaica house is desirous of getting in touch with Canadian manufacturers of wicker baby carriages, refrigerators, wicker parlor furniture, iron bedsteads, bedroom, parlor and dining room furniture and general house furnishings. Catalogues and price lists are invited. Enquiry 3053.

Mouldings and Carvings

Joliette, P.Q.,
August 3rd, 1921.

Editor, Canadian Woodworker,

Will you tell me where I can secure composition moulding and carvings suitable for furniture: also hardwood dowels, both plain and spiral grooved.

Sincerely yours,
R. T. Brazeau.

Composition carvings and mouldings suitable for use on furniture may be secured from the Decorators' Supply Co., Archer, Leo and Lime Sts., Chicago; the Waddell Mfg. Co., Coldbrook & Taylor N.W., Grand Rapids, Mich., or J. Walter & Sons, Kitchener, Ont.

There are a large number of Canadian firms manufacturing dowels. Would suggest that you try either the Canada Wood Specialty Co., Orillia, Ont., or J. R. Eaton & Son, Orillia.

Demand for Three-ply

A firm in Port Elizabeth is in the market for a quantity of three-ply material, and would like prices and delivery dates from Canadian manufacturers. Enquiry 3381.

Boxes and Box Shooks Wanted

A dealer in the Dutch West Indies is desirous of securing quotations on boxes and box shooks from Canadian box manufacturers. Enquiry No. 3356.

Progressive vs. Compartment Kilns

All dry kilns now on the market are either progressive or compartment kilns. In the progressive type the drying conditions increase in severity from one end of the kiln to the other, the material being moved into severer conditions as it dries. In the compartment type the same temperature and humidity prevail throughout the kiln at any one time, beginning with mild conditions and increasing in severity as the material becomes dry.

The kiln-drying data and experience of the Forest Products Laboratory indicate that each type has particular advantages on certain points, as follows:

The progressive type of kiln requires less skill in the operator. It consumes less heat per pound of water evaporated from the wood, but the saving of steam possible should not be considered so important as the question of ability to perform the work required with the best results. The progressive kiln reaches its greatest heat efficiency in drying from the green state, and is most useful in circumstances which permit of its being supplied continuously with green lumber of one thickness and class. It is, however, impracticable with this type of kiln to give individual attention to special loads of lumber.

The compartment type of kiln is more flexible and affords greater control over thed rying conditions, permitting less change in temperature, humidity, and circulation in the kiln with variations in the wind and weather. It is better adapted to meet the varying requirements of different kinds of material and is most useful where exact and careful drying is required, as in the handling of refractory woods.

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CABLE ADDRESS
"DARLOVE"

TWO BAND MILLS

CODES USED
UNIVERSAL
A.B.C 5TH EDITION IMPROVED
WESTERN UNION

The following is a list of unsold lumber on our Yards, nearly all of which is dry and available for prompt shipment. We solicit your inquiries and orders.

QUARTERED WHITE OAK

Ft.	In.	
50,000	3/4	No. 1 C&S
15,000	4/4	No. 1 C&S. Strips 2½-5½ in.
60,000	3/4	No. 2 Com.

PLAIN WHITE OAK

50,000	5/8	No. 1 C&S
25,000	1/2	No. 2 Com.

PLAIN RED OAK

20,000	5/8	12&Wdr. Cof. Bds.
20,000	3/4	12&Wdr. Cof. Bds.
6,000	3/8	FAS
40,000	1/2	FAS
250,000	5/8	No. 2 Com.
300,000	5/8	No. 3 Com.
200,000	3/4	No. 3 Com.

ELM

18,000	12/4	No. 1 C&S
45,000	6/4	Log Run.
60,000	8/4	Log Run.
12,000	6/4	No. 2 Com.
15,000	10/4	No. 2 Com.
15,000	12/4	No. 2 Com.
75,000	5/8	No. 3 Com.
40,000	3/4	No. 3 Com.

CYPRESS

15,000	4/4	FAS
15,000	5/4	FAS
60,000	6/4	FAS
60,000	12/4	FAS
30,000	4/4	Sel.
30,000	6/4	Sel.
75,000	4/4	No. 1 Shop.
60,000	6/4	No. 1 Shop.
45,000	8/4	No. 1 Shop.
15,000	6/4	No. 1 Com.
15,000	8/4	No. 1 Com.
30,000	6/4	No. 2 Com.
30,000	4/4	Peck.
30,000	1x6	No. 1 Com.
60,000	1x6	No. 2 Com.
45,000	1x6	No. 1 Boxing.

COTTONWOOD

45,000	4/4	FAS 6-12 in.
45,000	4/4	No. 1 C&S

PLAIN RED GUM

30,000	3/8	No. 1 C&S
20,000	3/4	No. 1 C&S
30,000	4/4	No. 1 C&S

PLAIN SAP GUM

75,000	5/8	FAS 6-12 in.
20,000	3/4	FAS 6-12 in.
40,000	5/8	FAS 10-12 in.
40,000	5/8	FAS 13-17 in.
100,000	3/4	FAS 13-17 in.
30,000	4/4	FAS 18-21 in.
20,000	4/4	FAS 20 in. and up.
25,000	5/8	No. 1 C&S
150,000	3/4	No. 1 C&S
30,000	4/4	No. 1 C&S
20,000	5/8	No. 2 Com.
30,000	8/4	No. 2 Com.
20,000	5/8	No. 3 Com.

QUARTERED RED GUM

40,000	5/8	FAS
17,000	3/4	FAS
100,000	5/8	No. 1 C&S
200,000	3/4	No. 1 C&S
15,000	4/4	No. 1 C&S
30,000	5/4	No. 1 C&S
40,000	6/4	No. 1 C&S

QUARTERED RED GUM
(Sap No Defect)

60,000	5/8	FAS
60,000	3/4	FAS
50,000	4/4	FAS
40,000	6/4	FAS
75,000	8/4	FAS
75,000	5/8	No. 1 C&S
125,000	3/4	No. 1 C&S
50,000	4/4	No. 1 C&S
15,000	6/4	No. 1 C&S
15,000	8/4	No. 1 C&S

ASH

4,000	3/8	No. 1 C&S
3,000	5/4	No. 1 C&S
4,000	6/4	No. 1 C&S
12,000	12/4	No. 2 Com.
15,000	4/4	No. 3 Com.
7,000	12/4	No. 3 Com.

It is understood that our stocks are constantly changing by reason of manufacture and shipment. We are prepared to surface one or two sides.

Our Sales Representative in the Chicago and Michigan Territories is the

LELAND STAVE & LUMBER COMPANY

HOME OFFICE LELAND, MISSISSIPPI

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C.W PARHAM, MANAGER

The Lumber Market

Domestic Woods

The opinion seems to be general among a large number of wholesale lumber merchants that prices have about touched bottom and that the last will shortly be seen of receding quotations. Of course all do not share in this opinion but the preponderance of belief is that base figures have now been reached in all woods with one or two exceptions. In the larger cities general building has also taken somewhat of a spurt, and there is a better feeling prevailing among retailers, many of whom are busy in their woodworking plants.

The air of speculation is slowly disappearing from the lumber arena, and there is not as much bartering and dilly-dallying about prices as there has been during the past few months. Many firms are adopting a finality in regard to quotations and are prepared to stand or fall at the figures named. Most of the large firms have taken a heavy loss and now feel that they are down to bed-rock. Those concerns who are financially able to hold their stock are not parting with it by any means unless they obtain what they consider a fair value. Prices are, certainly, considerably firmer in all lines of lumber than they were a few weeks ago and there is a steadying influence in hemlock and spruce. The feeling on the whole is more buoyant than it has been at any time during the summer, and while no one expects a record business this fall, still the turnover is going to be larger than many have been looking for.

In hardwoods there are many more inquiries, and when salesmen call upon large consumers they are given a hearing and asked the prices on different lines, whereas not so long ago many manufacturers absolutely declined to listen to such a thing as price, and were not interested at all in the situation, being stocked to the limit.

While buying is still carried on meagrely, it is felt that the tide is beginning to turn. There are signs of the resumption of industrial activity in many lines and the automobile business is pretty active at the present time. A number of motor firms are making inquiries for thick birch and ash No. 1 common and better, and in some of the upper grades of hardwood there is a limited quantity of the thicker stuff.

Prees are yet a long way from being stabilized, but except in the case of those who are compelled through financial or other reasons to dispose of their stock, there is no general weakening below the levels of valuation that have been current for some time.

Imported Woods

There does not appear to be any material change in the hardwood lumber situation. True, there is a better undertone in the various producing centres and many operators believe that the turn has been made. There seems to be a slight increase in the number of inquiries coming in although buying remains at about the same level. The furniture and other woodworking industries continue to buy in a hand-to-mouth fashion, this in spite of the fact that a shortage of many items, particularly upper grades, is bound to occur.

While the quantity of high-grade stock on hand is sufficiently low to cause a stiffening of values, yet certain manufacturers continue to sacrifice their better stock in an effort to raise sufficient funds to enable them to hold the vast quantity of low-grade material which has been accumulating at practically every mill. No attempt has been made to resume cutting or logging operations, so that stocks are slowly but surely being reduced.

According to a Memphis, Tenn., report, many operators anticipate an improvement in demand during the fall months. Exporters are taking more interest in southern lumber and a fair volume of stock is being sent overseas. Foreign inquiries are being received with gratifying regularity, and even though the price is not all that is desired, this movement is regarded as a very favorable development. Flooring manufacturers continue active and are in the market from time to time. Plain white oak is one of the strongest items in the field and many are suggesting that the price of No. 1 common, plain white oak will stabilize at abont $50.00.

According to an Evansville report, there have been some improvements in the situation. It would not be correct to say that there has been a rush for stock but there certainly is an improvement in demand.

The situation may be summed up by saying that while a shortage of certain grades and certain stock seems to be inevitable and may be accompanied by a stiffening of prices, there is no marked increase in demand nor do prices appear to be any firmer, and the hand-to-mouth policy adopted some time ago by many of the wood-using industries is still very popular.

To Stock and Handle Hardwoods

For the past few months the Toronto Veneer Co., Limited, Toronto, Ont., have been taking orders for hardwood lumber of different kinds. In order to perfect and improve this service, they are establishing a lumber yard in Toronto at which they expect to yard about 2,000,000 feet of dry band-sawn hardwoods, principally oak, gum, popular, walnut and mahogany. Carrying such a large amount of material in stock, will enable them to make prompt shipments of mixed carloads, and they will also be in a position to include veneers and plywood if desired. It is the intention of the Toronto Veneer Co. to sepcialize in soft textured Indiana white oak, together with mahogany and walnut. The yard is situated at Atlantic Ave. and the G.T.R. tracks.

Canadian Birch for Tea Chests

The Canadian birch is now used to a considerable extent in the manufacture of tea-chests for trade from the Orient, according to Mr. C. Stuart Brown, of the Acme Tea-Chest Company, who recently landed.

Tea chests are made from three-ply veneer, stated Mr. Brown, birch being used almost exclusively on account of its strength, combined with the lightness and preservative qualities. Some of the wood used in tea-chests can now be brought from Finland.

This manufacturer is making his first trip through Canada. He is going to Ceylon, Colombo and other great Oriental centres of the tea-growing industry. He formerly has been making these excursions through the Suez canal, but taking the Canadian route for the first time, states that he now realizes all that he has previously missed.

THE CHICAGO MIRROR
AND
ART GLASS COMPANY
Manufacturers
of
RELIABLE MIRRORS
AND
PLATE GLASS TOPS
Send your specifications
to us at
216 NO. CLINTON ST., CHICAGO, ILL.

Calhoun Plywood Company
Panels Tops Counter Fronts
OPERA CHAIRS
in the White or finished.
Vegetable or Waterproof
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Million Feet Bone Dry Hardwoods

Orders can be filled immediately

PHONE MAIN 210
705 Excelsior Life Building, Toronto
Anderson-Miller Lumber Co., Limited

In using "*Steelgrip*" CLAMP NAILS
only the ordinary machine work is required. Cut a slot, drive in a "Steelgrip," that's all. No clamping, no waiting for glue to set.

"*Steelgrip*" CLAMP NAILS
Save Time + Labor = Money
Produce, Strength + Durability = Better Product

For sale by dealers in Cabinet Hardware, or direct if you so prefer.

CLAMP NAIL COMPANY
4532 PALMER STREET, CHICAGO
CIRCULARS and SAMPLES ON REQUEST.

"Pony" Cabinet Clamp

For lightness combined with strength this clamp has no equal. All parts are selected from the best materials obtainable and we have spared no effort to make the "Pony" the finest thing of its kind on the market. Made in sizes to open 18 in. to 72 in.

"Jorgensen"

Peerless Adjustable Hand Clamp

Fits every grip without a slip and takes a tighter hold with less effort. It is a tool of real economy and a clamp that insures efficiency.

Adjustable Clamp Company

216 N. Jefferson St., Chicago, U.S.A.

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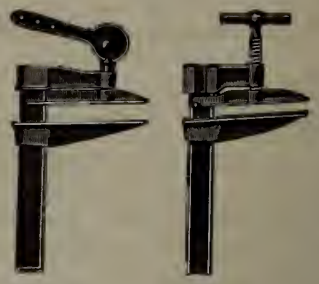
Lewis Bros., Limited .....Montreal

Colt's Clamps

for the

Woodworker



Colt's Universal and Vise Clamps are unsurpassed for the Furniture Manufacturer and General Woodworker. They are made right, both in design and quality of materials and workmanship.

Colt's Clamps are quick-acting and have broad jaw clamping surface.

For further information write for Catalogue No. 294.

Batavia Clamp Co.

235 Centre St. **BATAVIA, N. Y.**

Cabinet Makers' Benches, Clamps and Hand Screws

Manufactured by

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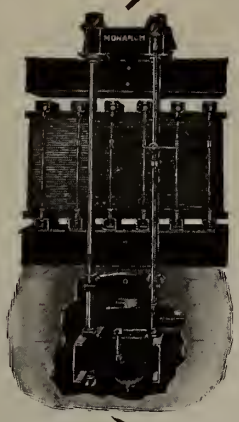

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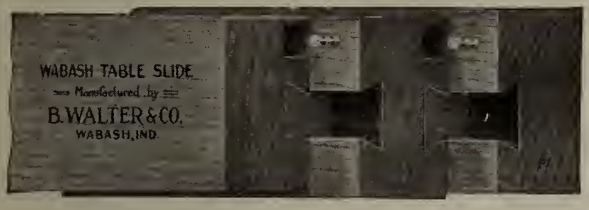

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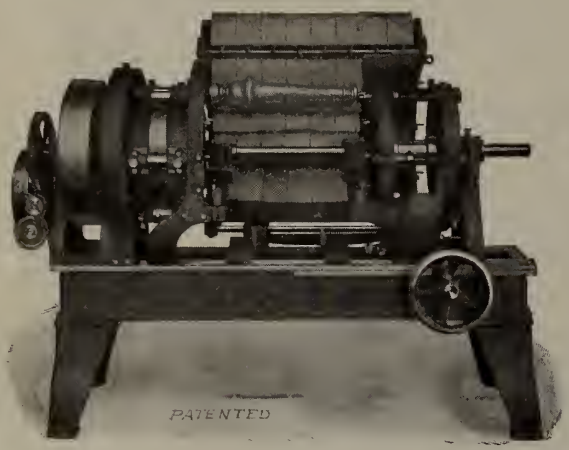

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Preston Woodworking Machinery Company, Preston, Ont.
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Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
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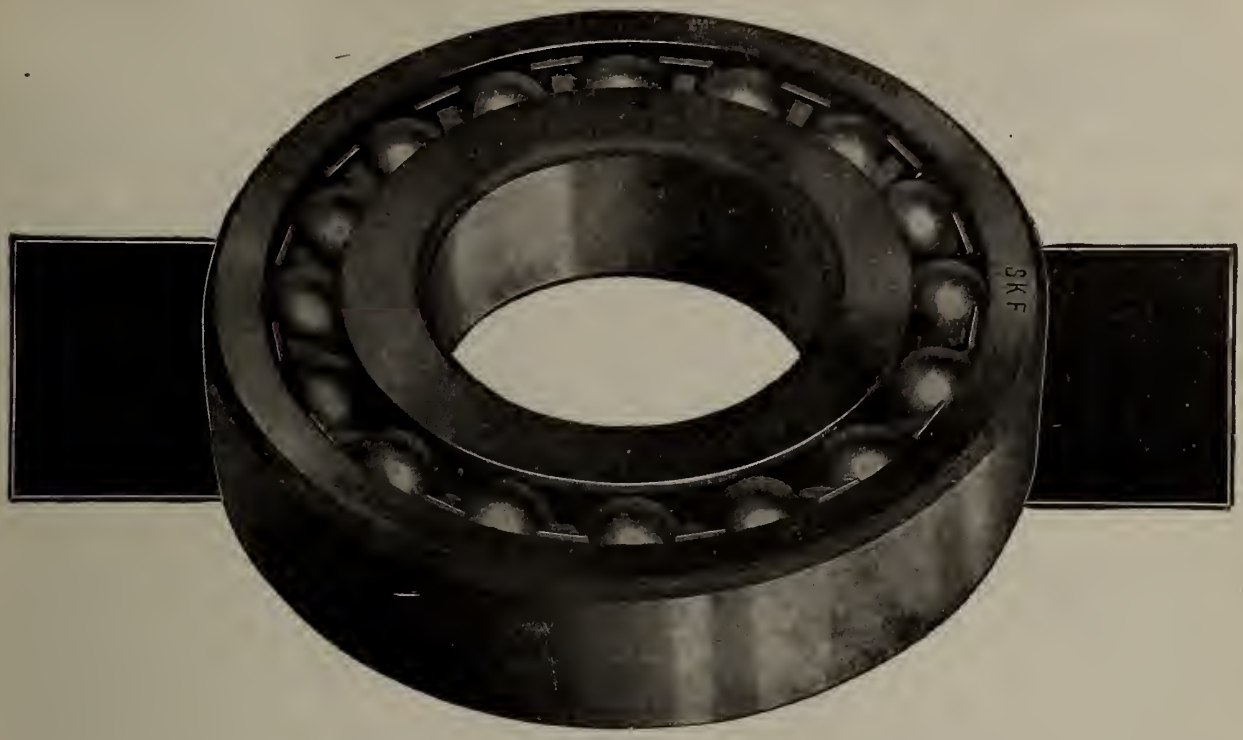

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Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

GRINDERS (Knife)
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Oliver Machinery Co., Grand Rapids, Mich.
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Whitney & Son, Baxter D., Winchendon, Mass

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Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

KNIVES (Planer and others)
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

LATHES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass
Williams Machinery Co., A. R., Toronto, Ont

LEATHER (Artificial)
Fibro Mfg Company, Beverly, N. J.
Mechanical Leathers, Ltd., Toronto.

LEATHER CLOTH
Zapon Leather Cloth Co., New York.

LUMBER MEASURER
Durant Mfg. Co. Milwaukee, Wis.

MACHINE KNIVES
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Peter Hay Knife Company, Galt, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont

MIRRORS
Chicago Mirror & Art Glass Co., Chicago, Ill.

MITRE SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.

MOTOR TRUCK EXTENSIONS
Swedish Crucible Steel Co., Windsor, Ont.

MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A. Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

NAILS
Laidlaw Bale-Tie Co., Hamilton, Ont.

NAILING MACHINES
Morgan Machine Co., Rochester, N.Y.

OIL
Zero Oil Co., Parkersburg, Pa.

OIL STONE GRINDERS
Mummert-Dixon Co., Hanover, Pa.
Oliver Machinery Co., Grand Rapids, Mich.

PANELS
Algoma Panel Co., Algoma, Wis.
Gorham Bros., Mount Pleasant, Mich.
Hardwood Products Co., Nennah, Wis.
Hay & Co., Woodstock, Ont.
Roberts, Geo. G., Chicago, Ill.
Waetjin & Co., L., Milwaukee, Wis.

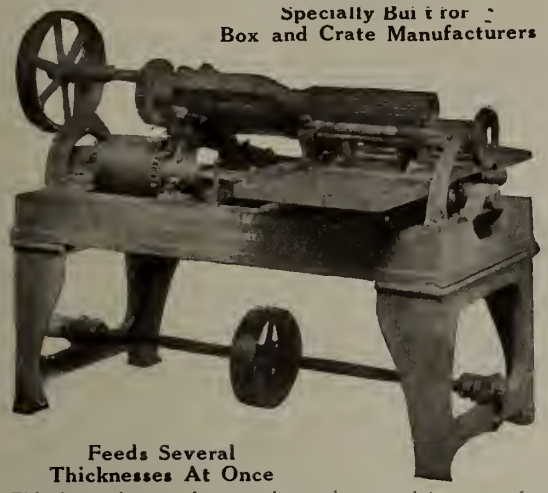
PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PERIOD MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich

PERIOD TURNINGS
Decorators Supply Co., Chicago, Ill.

"The Chattanooga" — Just Another Name For Fast, Economical Gang Ripsawing

Specially Built for Box and Crate Manufacturers



Feeds Several Thicknesses At Once

This latest improved gang ripsaw is powerful, fast, safe and eliminates wastage. For gang sawing boards into strips or head sticks and for ripping veneers it is unsurpassed.

Has powerful feed and securely holds down and feeds short pieces. The feed rolls are automatically adjustable to varying thicknesses. Upper rolls are driven by cut gears, and the lower ones by sprocket chain. Several thicknesses of veneering can be fed thru machine at one time.

The CHATTANOOGA is an unusually big producer, easily operated, and turns to profitable account short stuff lying around a mill—otherwise wasted.

Attractive price. Complete information on request

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Chattanooga, Tenn.

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Chair, Cane-Cutting and Bending Machines

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GARDNER, MASS.

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Woodworkers and Furniture Manufacturers

Your requirements in Reed Forms for Wicker Work Furniture, Mechanic's Tool Cases, Dowels, Novelties, Cedar Chests, Piano Lamps, Table Lamps, etc., can be promptly supplied by us.

We are always pleased to quote prices and give any information you may desire. Try us on your next order.

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Brantford Pattern Works
BRANTFORD

New and Used Woodworking Machinery

WE CAN SAVE YOU MONEY

Look over our PARTIAL LIST and if you do not see your requirements there—WRITE——WIRE—or—PHONE US:

1—Automatic Knob Machine.
1—Jig Saw, Goldie McCulloch.
1—Jig Saw, McGregor Gourlay, Wood Top.
1—Double Disc Sander, American, 36″.
2—Hand Screw Veneer Presses, 38″—3 Screw American.
1—Gravity Swing Cut-off Saw, McGregor Gourlay.
1—12″ Moulder, Cowan & Co., 4-sided.
1—16″ Buzz Planer, Clark-Demill.
1—36″ Preston Band Saw.
1—28″ Band Saw.
1—7″ Moulder, Cowan & Co., 3-sided.
1—Sash Sticker, H. W. Petrie.
1—Double Surfacer, C.M.C., No. 212—30″.
1—Dowelling Machine, M31, Cowan & Co., No. 2, Cap. up to 2½″.
1—Planer and Matcher, S. A. Woods, 15″ x 6″.
1—Double Exhauster, 45″, American Blower Co.

Also a Full Line of Transmission Supplies

General Machinery Company
67-69 Frederick St., Toronto
TELEPHONE MAIN 2200

"Canadian Woodworker" Buyers' Directory—Continued

PLANERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co.. P. B., Hamilton, Ont.

PLANING MILL MACHINERY
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Mattison Machine Works, Rockford, Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PRESSES (Veneer)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Jackson, Cochrane & Company, Kitchener, Ont.
Perrin & Co., Wm. R., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

REED
Carter & Co., E. T., Toronto, Ont.
Overseas Reed and Cane Co., Ionia, Mich.

REED MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

RESAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

RIM AND FELLOE MACHINERY
Defiance Machine Works, Defiance, Ohio.
Fay & Egan Co., J. A. Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mackenzie Machinery Co., D., Guelph, Ont.
Mattison Machine Works, Rockford. Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

ROSETTES
Waddell Mfg. Co., Grand Rapids, Mich.

RUBBING MACHINES
DeVilbiss Mfg. Co., Toledo, Ohio.
Mattison Machine Works, Rockford, Ill.

SAFETY DEVICES
Cowan & Company, Galt, Ont.

SANDERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SASH, DOOR & BLIND MACHINERY
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SAWS
Atkins & Co., E. C., Hamilton, Ont.
Disston & Sons, Henry, Toronto, Ont.
Radcliff Saw Mfg. Company, Toronto, Ont.
Seibert & Co., Louis, Cincinnati, Ohio.
Shurly-Dietrich, Ltd., Galt, Ont.
Simonds Canada Saw Co., Montreal, Que.

SAW SHARPENERS
Hooker & Son, O. V., St. Johnsbury, Vt.
Oliver Machinery Co., Grand Rapids, Mich.

SAW SWAGES
Atkins & Co., E. C., Hamilton, Ont.
Cowan & Company, Galt, Ont.
Crowel, D. J., Buffalo, N. Y.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.

SAW TABLES
Canada Machinery Corporation, Galt, Ont. ..
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SCRAPING MACHINES
Canada Machinery Corporation, Galt, Ont. ..
Garlock-Walker Machinery Co., Toronto, Ont.
Whitney & Sons, Baxter D., Winchendon, Mass.

SCREW DRIVING MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.
Reynolds Machine Co.. Massillon Ohio.

SCROLL SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont. ..
Casey Co., M. E., Montreal, Que.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Jackson, Cochrane, & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamiltonfi Ont.

SECOND-HAND MACHINERY
Casey, M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Osborne Sexton Machinery Co., Columbus, O.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Woodworking Machinery Co. of Buffalo, Buffalo, N.Y.

SHAPERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Sons, Baxter D., Winchendon, Mass
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SHAVING COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

STAINS
Ault & Wiborg, Toronto, Ont.
Williams Bros. & Co., Hounslow, Eng.

SINGLE SPINDLE BOXING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

STAVE SAWS
Atkins & Co., E. C., Hamilton, Ont.

STAVE SAWING MACHINE
Whitney & Son, Baxter D., Winchendon, Mass

STEEL DOOR MATS
Cary Mfg. Company, Brooklyn, N.Y.

SURFACERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Yates Machine Co., P. B., Hamilton, Ont.

SWING SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Eaglesfield, R. D., Indianapolis, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE LEG LATHES
Fay & Egan Co., J. A., Cincinnati, Ohoa.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE SLIDES
Jefferson Woodworking Co., Louisville, Ky.
Walter & Company, B., Wabash, Ind.

TEMPERATURE REGULATORS
Canadian Powers Regulator Co., Toronto, Ont.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Compan, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TIME CLOCKS
International Business Machines Co., Toronto, Ont.

TOPS
Gorham Bros., Mount Pleasant, Mich.

TRIMMERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Pretson, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TRUCKS
Cowan Truck Company, Toronto, Ont.
National Dry Kiln Co., Indianapolis, Ind.
Oliver Machinery Co., Grand Rapids, Mich.

TURNED WOOD GOODS
Algoma Wood Products Co., Algoma, Wis.
Canada Wood Specialty Co., Orillia, Ont.
Rowe Mfg. Co., Newaygo, Mich.

TWINES & WEBBING
Doon Twines, Ltd., Kitchener, Ont.

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NAILING MACHINES

Are built strongly for heavy continuous service. Machines adapted to all kinds of special nailing.

Regular machines for all sizes of boxes and crates.

Write us for descriptive literature.

Machines that save money

Morgan Machine Co.

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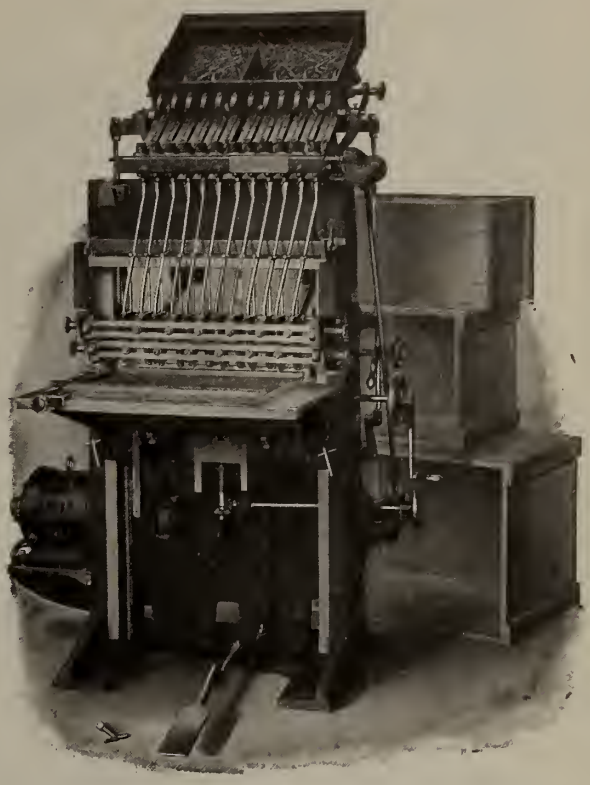
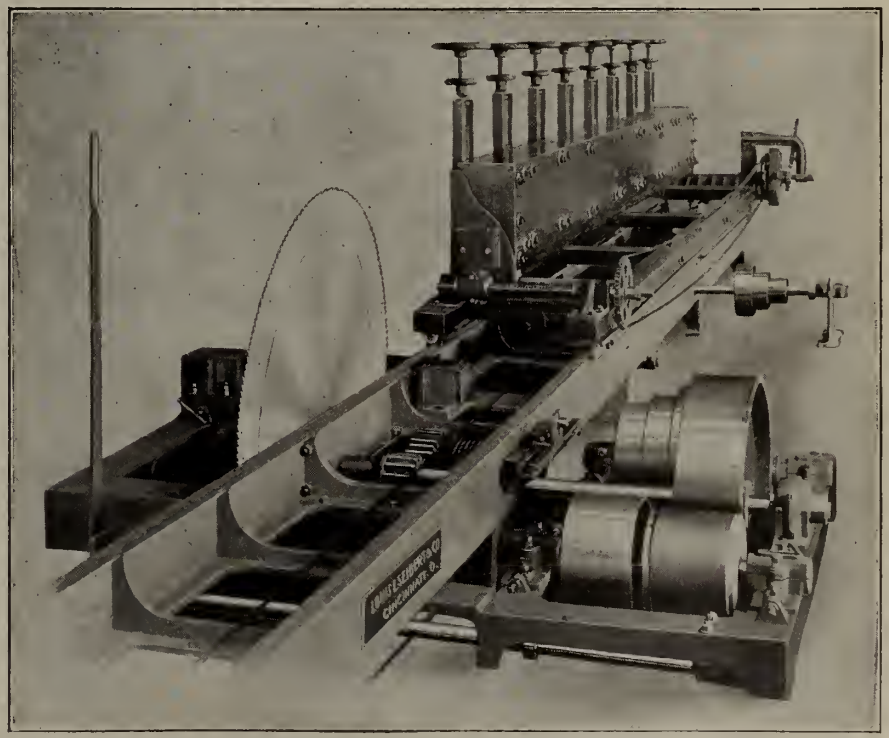


Morgan No. 12-30 Open Back Nailing Machine, Fitted with motor.

Veneer
and
Thin Lumber Saws

POSITIVE AUTOMATIC SET WORKS
AND
OFFSET



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Louis L. Seibert & Company, CINCINNATI, OHIO

"Canadian Woodworker" Buyers' Directory—Continued

VARNISHES
Adams & Elting Co., Chicago and Toronto.
Ault & Wiborg Company, Toronto. Ont.
Penfound Varnish Co., Toronto, Ont.

VARNISH DRYERS
Nicholls Co.. A. S., New York, N.Y.

VARNISH SPRAYERS
DeVilbiss Mfg. Co., Toledo, Ohio.
Paasche Air Brush Company, Chicago, Ill.

VENEERS
Batesville Lumber & Veneer Co., Lawrenceburg, Ind.
Birds Eye Veneer Co., Escanaba, Mich.
Bury & Compny, Robert, Toronto, Ont.
Central Lumber Co., Indianapolis, Ind.
Christmann Veneer & Lumber Co., St. Louis, Mo.
Curtis Co., C. E., Chicago
Dean Spicker Company, Chicago, Ill.
Empire Veneer Company, Chicago, Ill.
Evansville Veneer Co., Evansville, Ind.
Freiberg Lumber Co., Cincinnati, Ohio
Frye Lumber & Veneer Co., J. W., Dayton, O.
Hartzell, Geo. W., Piqua, Ohio.
Hoffman Bros. Company, Fort Wayne, Ind.
Holden, Henry S., Chicago, Ill.
Hardwood Prudocts Co., Neenah, Wis.
Korn-Conkling Co., Memphis, Tenn.
Long-Knight Lumber Co., Indianapolis, Ind.
Litton Veneer Co., Rockford, Ill.
Memphis Veneer & Lumber Co., Memphis, Tenn.
Mowhawk Veneer Co., Warren, Pa.
Munising Woodenware Co., Munising, Mich.
National Veneer & Lumber Co., Indianapolis, Ind.
North Vernon Lumber Co., North Vernon, Ind.
Northwestern Cooperage & Lumber Co., Gladstone, Mich.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod-Jurden Co., Memphis, Tenn.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Veneer Co., New Albany, Ind.
Roberts, Geo. G., Chicago, Ill.
Southern Veneer Mfg. Co., Louisville, Ky.
Stimson Veneer & Lumber Co., Memphis, Tenn.
Talge Mahogany Co., Indianapolis, Ind.
Thompson & Co., Lewis, Philadelphia, Pa.
Toronto Veneer Company, Toronto, Ont.
Veneer Manufacturers Co., Chicago, Ill.
Waetjen & Co., George L., Milwaukee, Wis.
The Williamson Veneer Company, Mills—Baltimore, Md. Sales Branches, New York, N. Y., Chicago, Ill., Jamestown, N.Y., High Point. N.C.
Warren Ross Lumber Co., Jamestown, N. Y.
Wood Mosaic Co., Louisville, Ky.

VENEER SAWS
Atkins & Co., E. C., Hamilton, Ont.

VENEER TAPE
Canadian Nashua Paper Co., Peterboro, Ont.
Gummed Products Co., Troy, Ohio.
Ideal Coated Paper Co., Brookfield, Mass.

VENTILATING APPARATUS
Canadian Blower & Forge Co., Kitchener, Ont.
Neville-Cooper Co., Toronto.

VENEER JOINTERS
Garlock-Walker Machinery Co., Toronto, Ont.

VENEER MACHINERY
Garlock-Walker Machinery Co., Toronto, Ont
St. Joseph Iron Works, St. Joseph, Mich.

VENEER PRESSES (Hand and Power)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Perrin & Company, Wm. R., Toronto, Ont.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WALNUT LUMBER
American Walnut Mfrs. Assn., Chicago.
Frye Lumber & Veneer Co., J. W., Dayton, Ohio.
Pickrel Walnut Company, St. Louis.
Porter, Frank R. Washington, D.C.
Purcell Walnut Lumber Co., Frank, Kansas City.

WINDOW FRAME MACHINE
Atlas Mfg. Co., Orlando, Florida.

WIRE
Laidlaw Bale-Tie Co.. Hamilton, Ont.

WIRE BOX STRAPPING
Cary Mfg. Company, Brooklyn, N.Y.

WOOD FINISHES
Ault & Wiborg, Toronto, Ont.
Penfound Varnish Co., Toronto, Ont.

WOODWORKING MACHINERY
General Machinery Co., Toronto, Ont.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOOD STAINS
Williams Brothers & Co

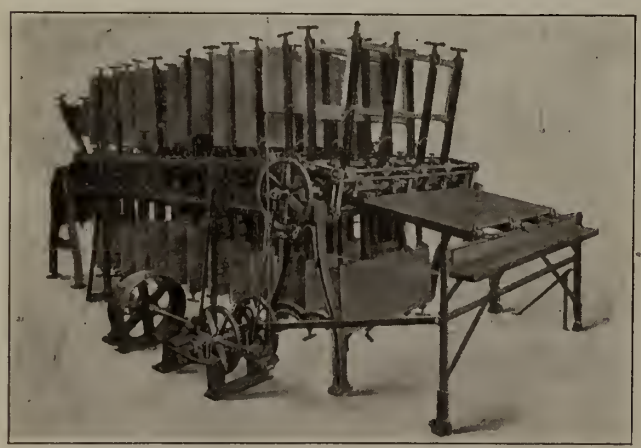
WOOD TURNING MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Yates Machine Co., P. B., Hamilton, Ont.

WORK BENCHES
Fay & Egan Co., J. A., Cincinnati, Ohio
Oliver Machinery Co., Grand Rapids, Mich.

WOOD LATHES
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOODWORKING SPECIALTIES
Brantford Pattern Works, Brantford, Ont.

One Man Does the Work of Two
with a Billstrom Glue Clamp Carrier



For every plant where much edge-gluing is done there is a real need for a Billstrom.
Here's why:—

The empty clamp is held at just the right height for the greatest convenience of the workman.
When the clamp is filled he pulls a cord, which carries the filled clamp away and deposits an empty one in its place.
One man can accomplish as much by using it as two men can do employing the old methods.
It holds the work off the floor until the glue has set, when the glued stock can be quickly removed and piled flat, thus greatly conserving space.
It reduces the labor and cost of edge gluing to the minimum.
There is a sizs to suit your particular requirements.

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2002 NINTH ST. ROCKFORD, ILL.

SIMONDS
SAWS and KNIVES

Are made right. Every operation from the making of the steel to the finishing and packing is watched by experienced workmen. The latest appliances known to the metal trades are used to insure the quality of SIMONDS Saws and Knives. After each operation they are inspected by experts for defects in quality and workmanship. The result—as good a saw as human skill and science can make. Prove it to your own satisfaction. Let us quote you on the tools you need.

Simonds Canada Saw Co.
LIMITED
St. John, N.B. MONTREAL, Que. Vancouver, B.C.

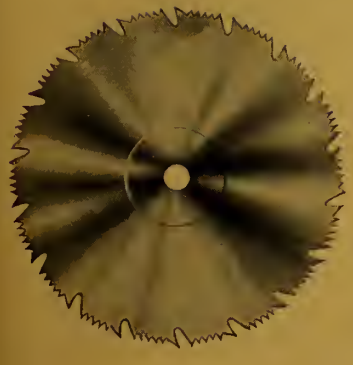
ATKINS

STERLING QUALITY

SAWS and KNIVES

mean continuous, efficient work and 100 per cent. production.

The extraordinary demand for more buildings and homes means that the Lumber output must increase.



Atkins Sterling Quality Saws and Knives will assist you in making the year 1921 the biggest and best in the history of your business.

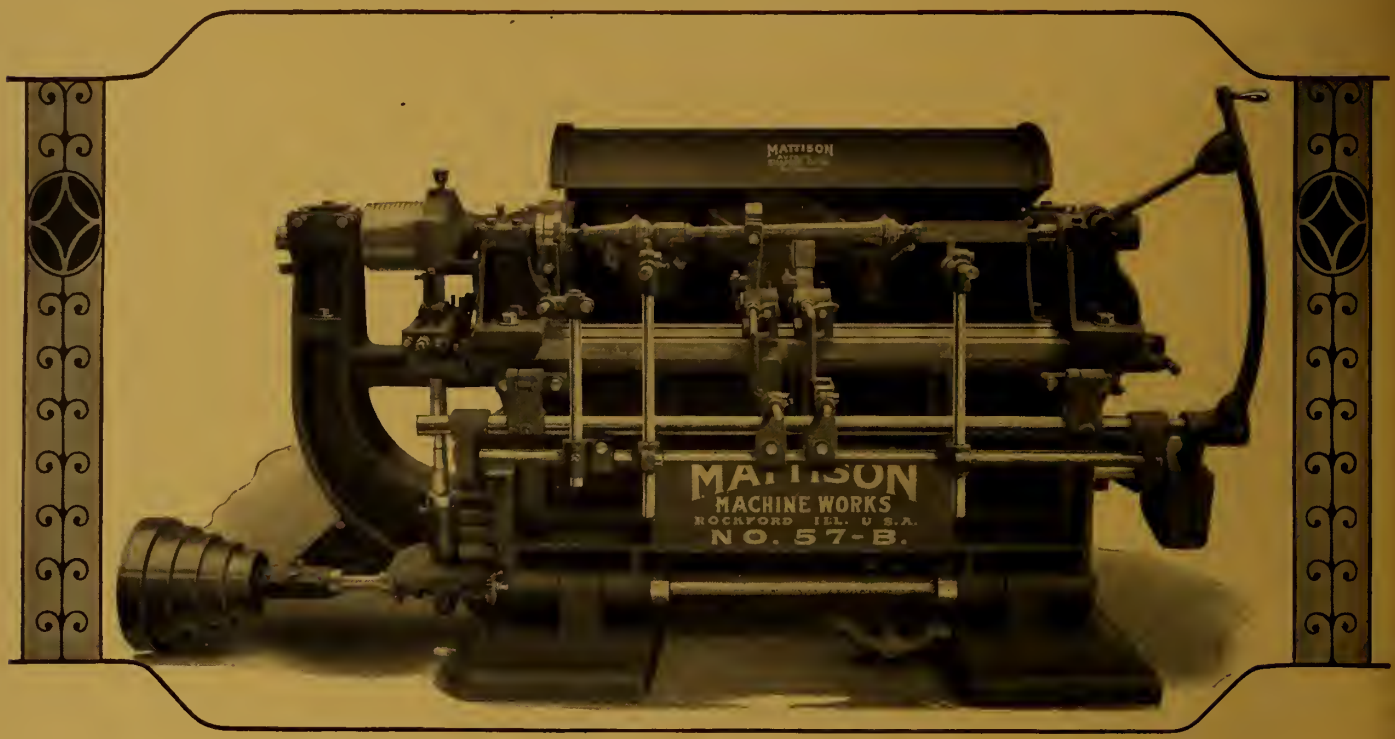
Write to-day for our Knife Booklet "C W"
and Pattern Template Paper.

E. C. ATKINS & CO.

Makers of Sterling Saws

Factory—HAMILTON, Ont. Vancouver Branch—109 Powell Street

MATTISON
Automatic
The Standard Shaping Lathe
OVER 3000 IN USE



New Styles Demand More Turnings

The Mattison Automatic Shaping Lathe produces turnings much faster and cheaper than is possible with hand methods or with old style machine equipment. But of even greater importance is its flexibility which gives your designer free play in creating his designs. It faithfully reproduces all the historic round, square and octagon turned work, which plays so important a part in the new, distinctive patterns of today

If it is worth while to bring out new patterns, isn't it just as important to give equal consideration to the best and most economical method of producing those patterns?

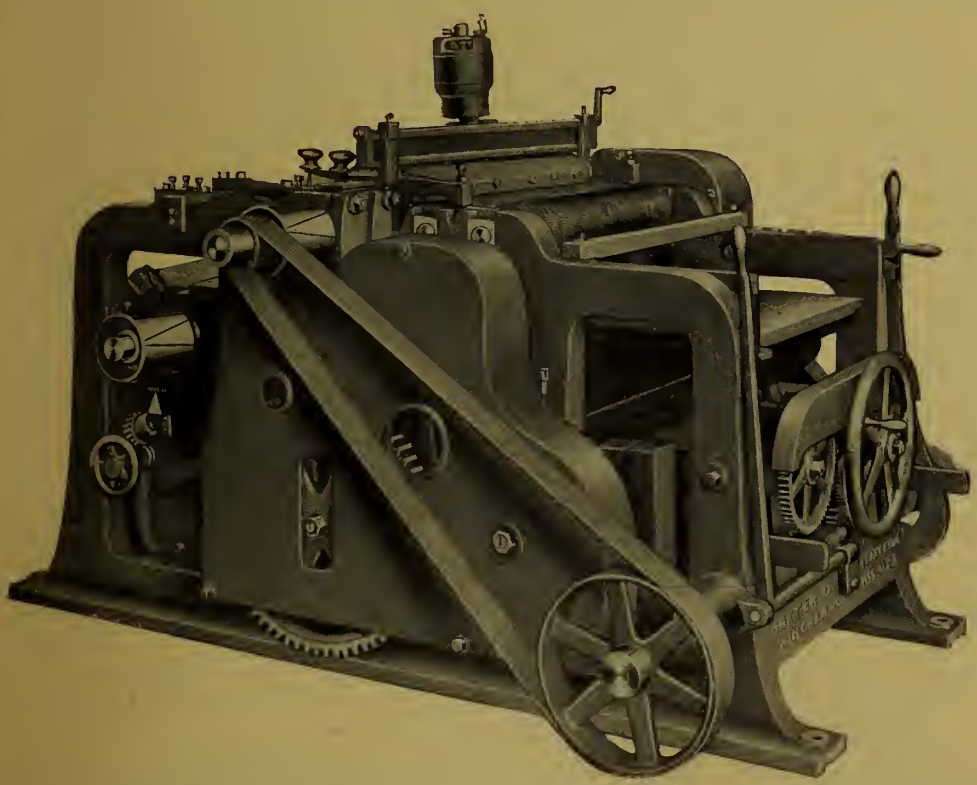
MATTISON
MACHINE WORKS
Rockford, Illinois, U. S. A.

Volume Twenty-One TORONTO, OCTOBER, 1921 Number Ten

CANADIAN WOODWORKER and Furniture Manufacturer

THE WHITNEY
No. 24 DOUBLE PLANER

is built to do the smooth and accurate planing required in Furniture, Desk, Chair and Cabinet Factories as well as Planing Mills and box Factories.



These machines can be furnished with two or four-knife Square Cutter heads or four-knife Round Cutter Heads, Flexible or Sectional Chipbreaker and Motor-Driven Grinders and Devices.

Special Features

A Rigid Frame.
Bed raised and lowered on inclines.
Power hoist for bed.
Hardened Tables opposite cutter heads.
Automatic Chipbreaker.
Eight gear-driven feed rolls.
Two sectional infeed rolls.
Positive and powerful feed.
Clamp cutter head boxes.
Cutter heads with long bearings and large diameters.
Cutter heads belted at both ends.
Machine cut gears.
Lower head easily and quickly removed.

Baxter D. Whitney & Son, Inc.

Winchendon, Mass. *Can. Selling Representative—H. W. Petrie, Ltd., Toronto, Ont.*

CONDIT

No Power Circuit Should be Broken with a Knife Switch

Condit Type N-2 Oil Switch

Condit Type 1 Oil Starter

By using Condit Oil Starters and small industrial Oil Switches to protect small motors and small power and lighting circuits in woodworking plants, the fire hazard is eliminated and many delays caused by trouble with small motors not properly protected, is avoided. When a circuit is opened, the arc is under oil which immediately extinguishes it. Thus, serious trouble very often caused by knife switch blades burning in ways which prevent proper contact and allowing a three phase motor to operate on single phase, is obviated.

Our Nearest House can Supply You

Northern Electric Company
LIMITED

Montreal Halifax Quebec Ottawa Hamilton
Toronto London Windsor Winnipeg
Regina Calgary Edmonton
Vancouver

CONDIT: *the Synonym of Safety in Electrical Protective Equipment*

Garlock Walker's New Office

We have moved our office from 32 Front St. West to 163 Dufferin St., thus consolidating office and warehouse. We will be pleased to see an old and new customer at our new address. Take King West car to Dufferin St. and walk two blocks south towards Exhibition grounds.

If you need additional machine equipment or are interested in the latest improved machines, write us.

A few machines offered from stock are listed below :

1—McGregor-Gourlay Double Arbor Universal Saw Table, same as C.M.C. No. 618, with 14" saws, self-contained countershaft, full complement of gauges, saws, wrenches, etc.

1—Preston No. 127 Variety Saw Table, countershaft attached, one 14" saw.

1—Ballantine 36" Band Saw, with solid lower wheel, complete with saw blades, wrenches, etc.

1—Ballantine Two Spindle Shaper, Spindles 20½" centres, diameter of spindles where collars go on 1⅛", top 42" x 42".

1—American No. 1 Single Spindle Shaper. Fig. 937 with plain countershaft.

1—C. M. C. No. 507 Mortiser, with boring attachment.

1—C.M.C. No. 624 Hand Feed Rip Saw Machine, with self-contained counter shaft, table 6'6" long by 40" wide, with plain box gauge, 22" saw blades, 1¼" arbor with cone for receiving saws different diameter.

1—Ballantine 8" Four Sided Moulder, complete with square heads and straight knives on all heads.

1—American No. 2½ Single End Tenoner, with two copes and cut-off saw attachment. Fig. 9431 in American Woodworking Machinery Catalog.

1—C.M.C. No. 646 Roller Table Cut-off Saw, sliding table 7'6" long, stationary table 50" to the saw, sliding table equipped with stop gauge, including five stops, with countershaft, complete with saws, wrenches , etc.

1—Cowan Combination Vertical and Horizontal Boring Machine, complete with wrenches, etc.

1—Hespeler 12" Buzz Planer, fitted with round cylinder, full set of knives, countershaft, wrenches, guard, etc.

1—Preston 36" Band saw, lower web wheel and guards.

8—Sections Cowan Four Screw Veneer Press 12"x50", four sections 27" clear space under screw plates, four sections 32" under screw plates.

1—24" Francis Double Roll Glue Spreader.

4—Sections Cowan Three Screw Veneer Press 38"x12", 28" clear space under screw plates.

1—C.M.C. Arm Sander, No. 438, with paper cutter.

1—Universal Knife Grinder, 37", made by American Wood Working Machinery Co., Fig. 1126 in their catalogue.

1—60" Sturtevant Single Slow Speed Exhauster, left hand, top vertical discharge, complete with platform and rods to suspend from ceiling.

1—Cowan Chain Mortiser with grinder.

1—Ballantine 36" Band Saw, lower web wheel.

1—American No. 3 Double Cut-Off Saw, new machine, capacity from 8" to 6' 9" in length, 4" thick and 30" wide.

1—American No. 25 Edging and Ripping Saw, new machine.

1—American No. 30 Double Arbor Universal Saw Bench, new machine.

1—Preston 24" No. 121 Pony Planer, used only couple of months.

1—McGregor-Gourlay 24" Pony Planer.

1—Mershon Band Rip Saw.

SPECIALS

1—Morgan Two-Arm Shook Fastener, used machine, but in firstclass condition.
1—Used Morgan Eight-roll Box Board Matcher.
1—Used Morgan 12-spindle Double Row Chucks, Open Back Nailing Machine.

American No. 25 Power Feed Edging and Ripping Saw

Garlock-Walker Machinery Co., Limited

163 Dufferin St.

WINNIPEG TORONTO MONTREAL

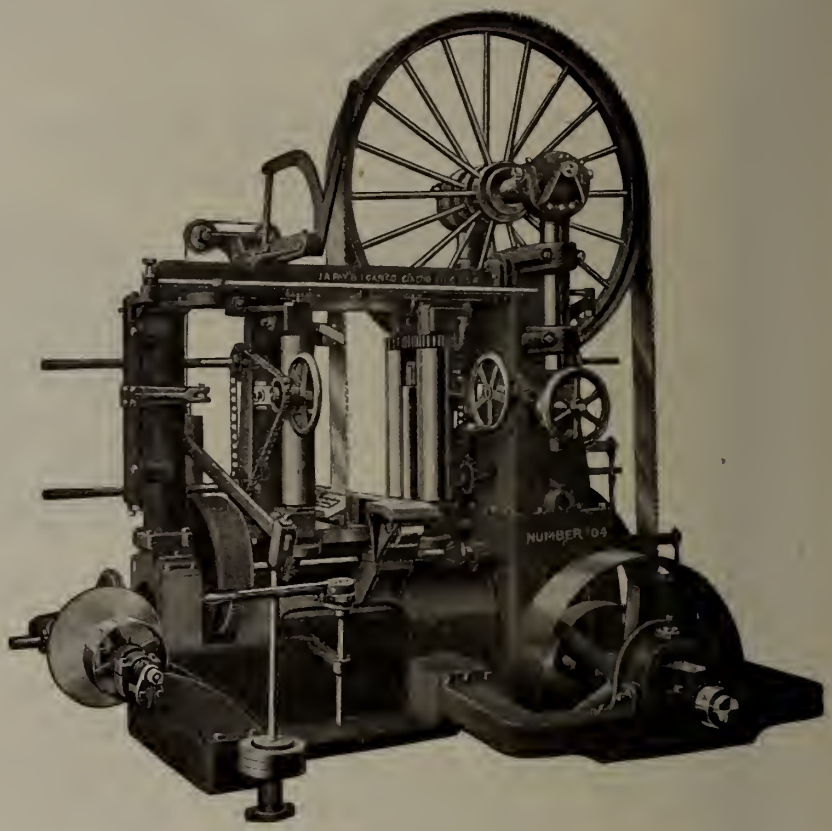
Everything in Woodworking and Metal Working Machinery

American No. 2½ Single End Tenoning Machine

An Ideal Machine for the Box Maker

"The Lightning" Line
TRADE MARK REG.

Write for Bulletin N-4



No. 104 "Lightning" Band Resaw

Box manufacturers find this especially valuable for cutting Cottonwood and other woods of similar stringy nature. It is the only Resaw made that will straighten a crooked, warped or uneven board.

Resaws stock up to 24" wide, takes 20" between rolls, saws to center of 16" and 28" stock can be passed under upper guide.

J. A. Fay & Egan Company

Established 1830

World's Oldest and Largest Manufacturers of Woodworking Machinery

153-173 W. Front St., CINCINNATI, OHIO

ACCURACY

That's the main point in a Glue Jointer. It must make at machine speed joints so smooth and straight that they can scarcely be detected in the finished product. Such a machine is

Yates No. 213 Continuous Feed Glue Jointer

The 213 is adaptable to many other kinds of work as well as Glue Jointing, and has so proven itself. With a 213, short and narrow stock can be accurately jointed and glued together, thus saving these small pieces that otherwise would go to the scrap heap.

Get a copy of our New Glue Joint Book. Most comprehensive book on Glue Jointing published. . . . Sent gladly upon request.

P. B. Yates Machine Co. Limited

Hamilton - Canada

No. 605 Self Feed Rip Saw

"BEST YET" is the unanimous verdict of woodworkers whe have examined this RIP SAW.

Pressure on feeding rolls is applied directly in line with the cut, making the cut very accurate. No straining of the feed yokes and throwing stock out of true.

This is just one of its points. Let us tell you of the others. Special bulletin on request.

CANADA MACHINERY CORPORATION, GALT, ONTARIO
LIMITED

Toronto Sales Office - - 721-2 Bank of Hamilton Building.

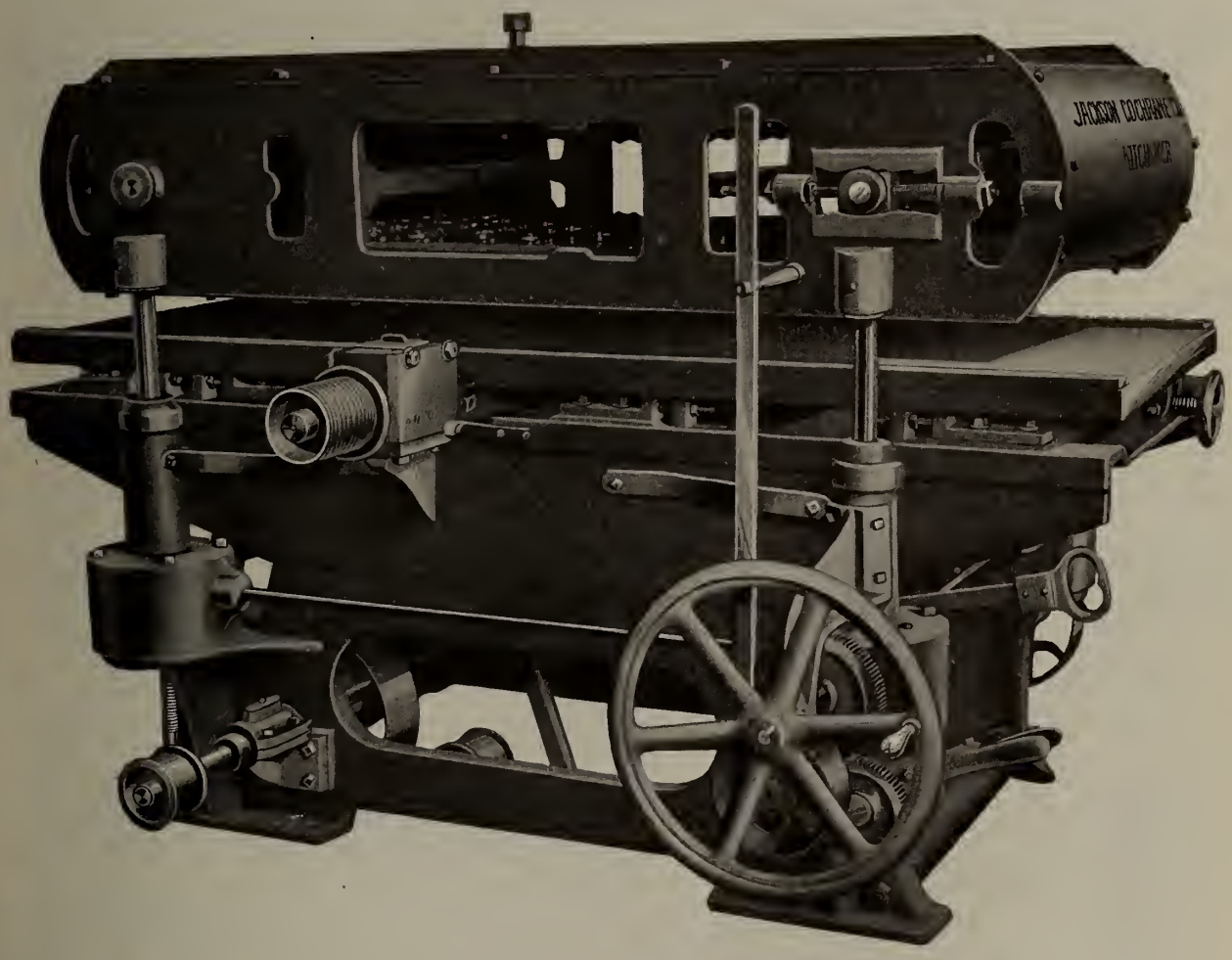
The

Herzog Self-Feed Jointer

means

Increased Production **Simplicity of Operation**
Small Floor Space **Safety to Employees**

Does four times the work of the Hand Jointer

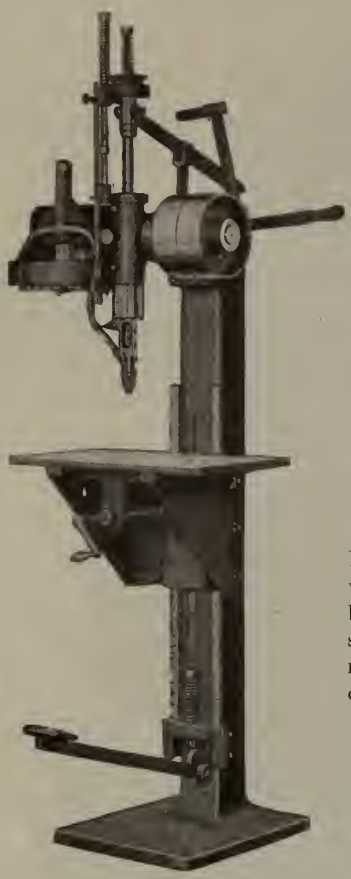


Our No. 34 Herzog Jointer, illustrated above, is one of the most effieient machines on the market to-day. It is appreeiated by the manufacturer and employees alike, beeause, while it will produce from three to five times as mueh work as the hand jointer, it does not require skilled operators, but eliminates the danger so common to other makes. It can be operated by two boys. It will handle stoek varying in width from 1 ineh to the full width of the jointer, will feed fast or slow, takes only one-fourth the floor space of hand jointers, and requires only one-fifth of the sharpening of the knives. It is fitted with power feed raising and lowering attachment, with cylinder double belted and driven from both ends.

If interested in reducing your costs, write us

Jackson, Cochrane & Company

KITCHENER - CANADA



Drives machine screws wood screws, stove bolts, hex.head or square head bolts, or most anything that can be magazined.

This Machine Reduces Production Costs

Everybody is demanding lowered prices and everywhere manufacturers are faced with the problem of lowering production costs.

To the woodworker and furniture manufacturer and everybody driving screws in quantity this Magazine-Fed Screw Driving Machine offers a definite solution.

Write us to-day, giving dimensions of your work and gauge and length of screws used. We will send you literature for your files.

The Reynolds Machine Co.

Department C

Massillion, Ohio, U. S. A.

P. L. Robertson Mfg. Co., Ltd.

Milton - - Ontario

To the manufacturer of furniture nothing could be more logical than the use of the Robertson Patented Socket Head Wood Screws.

It matters little whether the screws are driven by hand or machine, the saving in time and labor is the same. And, of course, with this screw the work is much neater, for the driver never sleps out, consequently scratches and other disfiguring marks are eliminated.

Used by Canada's largest manufacturers.

Write us for samples, prices and full details,

Drivers Supplied Free With First Order.

Nailing Machines

Yates

Let's tell you what it is possible to do with a nailer.

Write Us

NO. 830 OPEN BACK PLAIN

NO. 840 OPEN BACK WITH SIDE ARM

P. B. Yates Machine Co. Ltd.

Hamilton Canada

H. W. PETRIE LIMITED

H. W. PETRIE LIMITED TORONTO

CANADA'S DEPENDABLE
MACHINERY and SUPPLY HOUSE

NEW AND USED
WOODWORKING MACHINERY

Let us Quote on Your Requirements

131-147 FRONT STREET WEST TORONTO

HAMILTON OFFICE: 4 KING STREET WEST

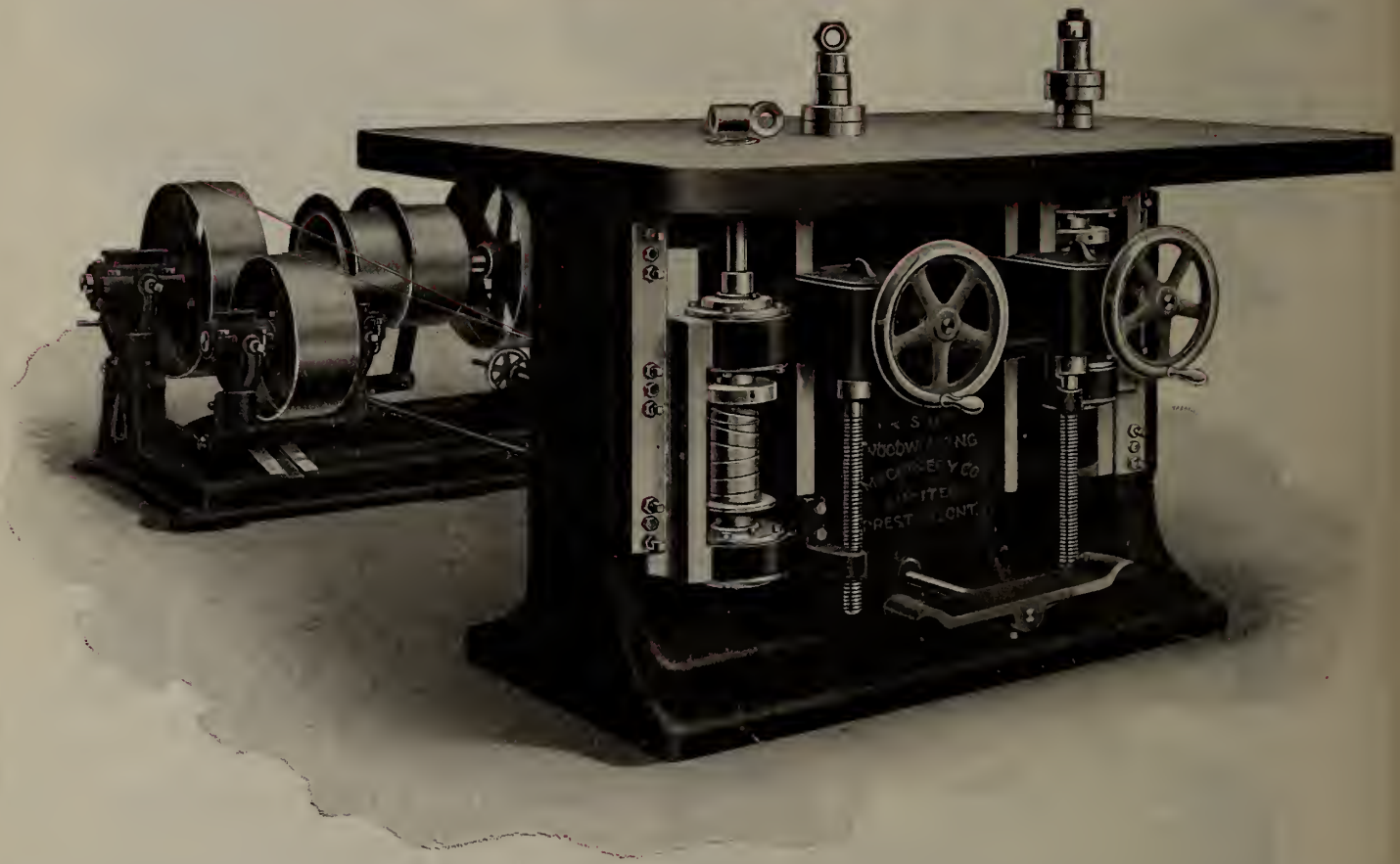
You can Double your Shaper Output

with one of our No. 162

HEAVY HIGH-SPEED BALL-BEARING SHAPERS

and you can also

Improve the Quality of your Work



May we have a chance to prove this strong statement to you when you need a Shaper?

We have specialized in Ball Bearing Shapers for twelve years and offer you a machine having every known and modern improvement. We will gladly furnish you with the names of a hundred users as proof of our claims.

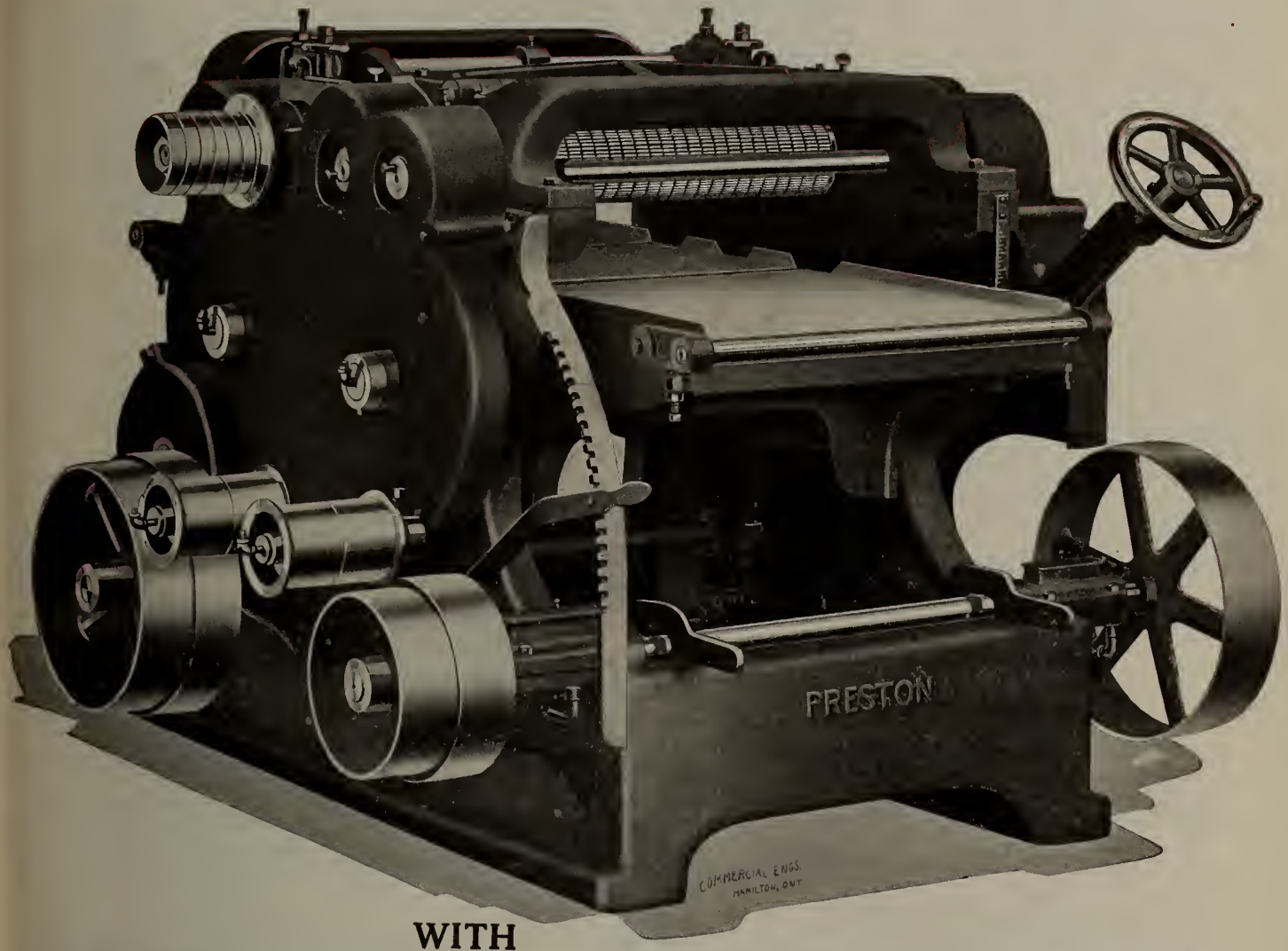
PREDOMINANT FEATURES—Spindle speeds, 7,000 to 12,000 r. p. m. Specially selected S. K. F. Ball Bearings. Weight, 2,850 pounds. Built with either one or two spindles.

The Preston Woodworking

PRESTON,

We are the Sole Manufacturers and Agents of the Eaglesfield Patented Beltless Swing Saw

Introducing a New High Speed Ball Bearing Surface Planer



WITH

(1) Specially selected S. K. F. Ball Bearings (2) Sectional Roll and Sectional Chipbreaker
(3) Round Cylinder with 4 High Speed Knives (4) Stockbridge Knife Grinder and Jointer
(5) Cylinder Speed, 5000 r. p. m.

The above is a cut of one of our No.123-30" single surface Planers recently shipped a customer. We have supplied a number of them within the last two years, equipped exactly as above and would gladly show you the machines in operation in the different plants where sold. Speeded up, as this machine was, to 5000 R.M.P. (or to suit a customer's requirements) there is no question but what production and the quality of the work in any Plant will be greatly improved. It also raises the grade of your stock. Lumber run through our machine can be graded much higher than if run through a slower speed babbitt bearing machine. The machine can be used either as a roughing or a smoothing planer and will give 100% satisfaction.

Machinery Company, Ltd.

ONTARIO

Specialists in Ball Bearing Woodworking Machinery

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GOOD VALUES

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Q. 1.—Practically new Berlin, 30", 3 drum Sander, variable feed.

48850.—Berlin Royal Invincible three drum Sander, with power raising rolls, spiral drums and variable feed used.

50837.—No. 7 McGregor Gourlay, 54" Band Re-Saw, cuts 6" on one side, and 3½" on the other, resaws, 20" wide, used.

50958.—No. 4½ 30" American Sectional Roll Cabinet Planer, used. with sectional feed rools and sectional chip-breaker.

2323.—No. 107 Crescent Woodworker, new.

51181.—Yates Type 2-G Straight Edge Ripper, 10" saw, with revolving bed, used.

51248.—Fay and Egan No. 112 Lightening Flooring Planer, to plane, and match 6" wide, 4" thick, 8 feed rolls, used.

51394.—C.M.C. Dowel Machine, No. 927, with three heads, used.

50892.—No. 129 Preston power feed rip saw, 22" saw, cutting 7¼" stock, used.

48627.—Morgan Boxboard Matcher, feed 130 feet per min. long and short boards, as short as 5", used.

50775.—Preston High Speed Ballbearing Shapers, new and used.

51132.—New No. 430 C.M.C. Suspension type Lucas Belt Sander.

This represents but a few selections from one of the largest stocks of first-class thoroughly re-manufactured Woodworking machinery to be found in Canada. .Write for quotations and full particulars.

If It's Machinery—Write "WILLIAMS"

The A. R. Williams Machinery Co. Limited

64 FRONT ST. WEST - TORONTO

Phone Woodworking Machinery Dept., Adelaide 20

Full lines of Iron and Wood-Working Machinery, Boilers, Engines and Contractors' Machinery, Electric Motors, Saws, Shingle and Lath Mill Machinery, etc.

HALIFAX, N.S. ST. JOHN, N.B. MONTREAL, P.Q. TORONTO, ONT.
VANCOUVER, B.C. WINNIPEG, MAN.

"OLIVER" Wood Trimmers

YOUR JOBS

are different, of course. The simple examples illustrate cuts and fitting of joints best performed on a precision wood trimmer.

"OLIVER" WOOD TRIMMERS are built in five sizes, ranging from the No. 0, with 6 in. stroke, up to the No. 10, with 26½ in. stroke. Ask for Bulletin describing these tools and their application to various kinds of precision wood trimming.

No. 9 Oliver Wood Trimmer

"Oliver" Quality

Woodworking Machines

Sawing Machines
Circular, Band, Swing, Rip, etc.

Planing Machines
Surfacers, Jointers, Safety Cylinders.

Turning Machines
Pattern Lathes, Speed Lathes.

Sanding Machines
Disk, Spindle, Belt, Variety.

Boring Machines
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Tenoning Machines
Single End, Ball Bearing.

Shaping Machines
Double Spindle, Ball Bearing.

Grinding Machinery
Grindstones, Oilstone Grinders, Knife Grinders

Oliver Machinery Co.

Grand Rapids, Mich., U.S.A.

The Shimer Round Safety Cylinder with High Speed Knives

A Round Safety Cylinder that will Appeal to the Buyer and the User for three Reasons:

The first is our adjusting nut for setting the knives. It is the only cylinder with properly located adjusting nuts for setting the knives, which, with our way, can be set to 1-1000 of an inch.

The second is our way of holding the knife without tapping into the head.

The third is the correct angle of cut for the knives.

Made for Any of the Different Makers' Machines and in Any Length Cylinder.

WRITE FOR PRICES

SHIMER CUTTER HEAD CO. OF CANADA, LIMITED

Manufacturers of Cutter Heads, Safety Cylinders and Grinders

GALT, ONTARIO

The Mereen-Johnson Resaw

has many features of advantage which place it far ahead of anything in the Resaw field.

No pulleys—no belts—no frictions.

The sprocket and chain arrangement for changing speeds is only one of the many improvements on this machine.

Write for circular.

Mereen-Johnson Machine Co.

Minneapolis Minnesota, U.S.A.

Borer 321

Tilting and Plain Table.
Simple to Adjust. Easy to Operate.
Strong, Steady and Accurate.
Spindle 12 in. from post; travels 6 in.
Table 14 in. x 28 in.
Adjusts 15 in. Vertically.

Prices of this or other WOODWORKING MACHINERY on application.

Cowan & Company of Galt

Limited

Galt Ontario Canada

The Productimeter

A real lumber meter, of extremely substantial construction, making it more than equal to the hard usage to which it is sure to be subjectedin wood-working plants.

For use on moulders, matchers, stickers, flooring machines and self-feed rip saws.

Other designs for other machines. Mention the machine whose output you want to count, or measure, and we will send you the right Productimeter for a 30 days' trial.

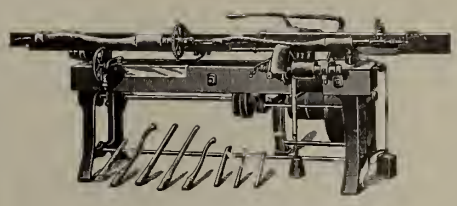
Durant Manufacturing Co.

615 Buffum St. Milwaukee, Wis.

1161

Klotz Machine Co's
Handle Machinery

Used Wherever Handles Are Made



42-Inch Handle Lathe

Lathes for turning Ax, Adz, Hammer, Hatchet, Pick, Sledge Handles, etc., and for turning other irregular articles. We also make Wine Maker's Machinery, Shafting, Pulleys, Hangers, etc.

Bolting, Blocking, Shaping and Cut-off Saw Machines, Handle Knobbers, End Shapers, Polishers and Throaters.

MANUFACTURED BY

Klotz Machine Co., Sandusky, O., U. S. A.

Write for descriptive circulars and prices.

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Williamson Veneer Co. 98
Wisconsin Lumber Co. 60
Wisconsin Veneer Co. 92
Wood Mosaic Co. 101

Yates Machine Co., Ltd., P. B. 5-9
Yellow Poplar Lumber Co. 50
Young Lumber Co., Bedna 40

Zero Oil Co. 87

"Chicago Rawhide" Cut Lacing

Cut from the centre portion of the hide

The Orignal Rawhide.

Every lace tested and selected for tensile strength. All hand cut from the centre portion or best part of the hide. No chemicals or acids used in the preparation. Always remains soft and pliabl e

Samples and Prices Gladly Furnished.

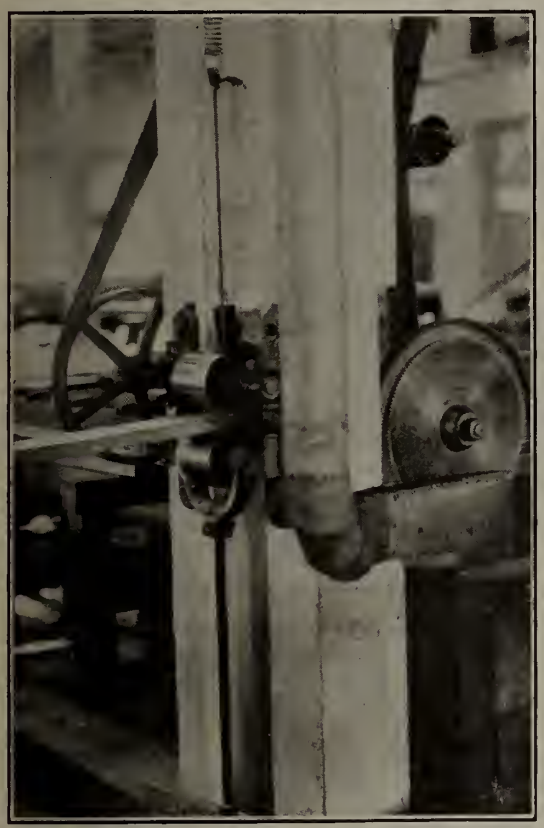
MECHANICAL LEATHERS LIMITED

126 Garden Avenue, Toronto

Canadian Representatives of the Chicago Rawhide Manufacturing Company

If made of hide for mechanical purposes we have it

A Real Trimmer



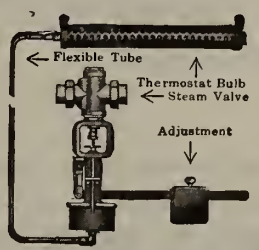
This is a high speed machine to be used in sawmills and box factories where speed is required. Allows men to use both hands when trimming. Nothing to get out of order. This is the fastest trimmer on the market.

Arbuthnot Lumber, Sash and Door Co.

Vancouver, B.C.

You Don't Guess Time! Why Guess Temperature?

In the glue kettle, the varnish drying room, the dry kiln—wherever there is a need for maintaining a definite, even temperature, the Powers Automatic Heat regulators give "100 percent perfect" results. They are always on the job—accurate, sure, reliable. They prevent overheated glue, checked or case-hardened lumber, crazed varnish—all the errors that are so apt to creep in with manual control.



The Powers Regulator No. 15

Entirely self-contained. Peculiarly adapted for control of drying room, kiln, etc.

Other Powers Regulators for other places. Ask for details.

We shall be glad to give you the benefit of our more than thirty years experience in temperature regulation, and if you will tell us where you would like to try out a Powers Regulator, we will send the right one for thirty days' trial. If you don't find it satisfactory, send it back.

THE CANADIAN POWERS REGULATOR CO., Limited

— Specialists in — Automatic Heat Control

82 CHESTNUT ST., TORONTO, Ont.

[1079D]

Cross-Cut Mitre and Rip Saw Table

A machine with a reputation for speed and economy. Made throughout of the finest obtainable materials and exhibiting the most careful workmanship.

This machine would not be long in paying for itself, and the improvements in the quality of the work would at once be apparent.

Write us for full details, including prices, etc.

D. McKENZIE MACHINERY CO.
Manufacturers
Guelph - Ontario

MAPLE LEAF SAWS

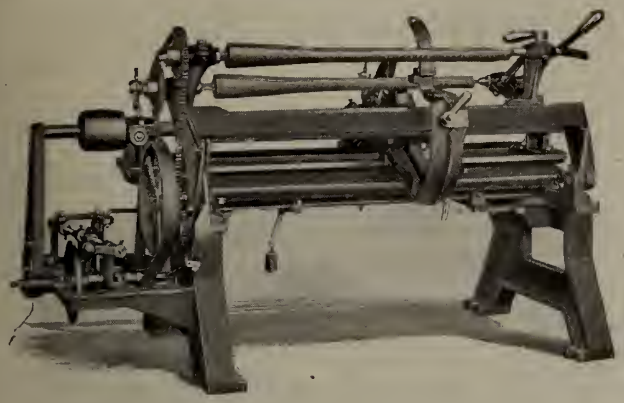
Maple Leaf Saws will give you just that steady, day-in-day-out service that means so much in your plant. They are made with this object in view. The whole process of their manufacture, from the selection of the highest grade steel to the time they leave our hands is attended to with the greatest care.
The complete line includes Bands, all kinds of Special Saws for Special Work, Cross-cut Saws, Gang Saws, Dado Heads, etc. Every one guaranteed to merit your approval.

Write for a copy of our catalogue.

The Largest All-Canadian Saw Manufaoturers

SHURLY - DIETRICH, LIMITED, GALT, CANADA

Store and Repair Branches at Vancouver and Ottawa



Wood Turning Machinery

for making Handles, Spokes, Ball-Bats, Spindles, Table Legs, Chair Legs, Whiffletrees, Neck Yokes, Etc.

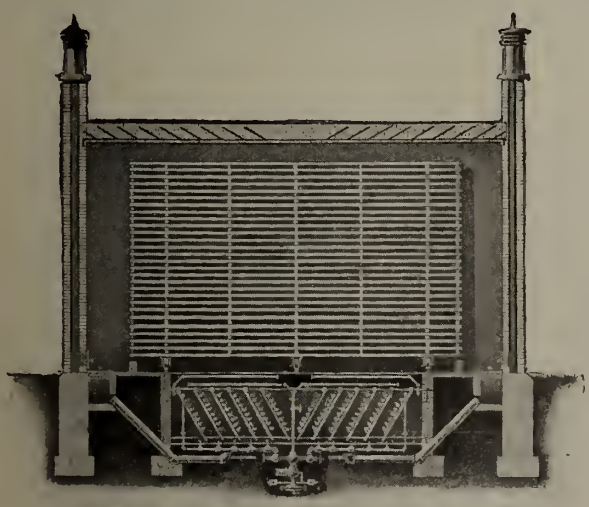
ALSO SANDERS, RIP SAWS, CUT OFF SAWS, ETC.

Our machines are
SIMPLE, STRONG, DURABLE

Write for free catalogue No. 31

THE OBER MFG. CO.
CHAGRIN FALLS. O., U.S.A.

Thermo-Myst System



BEFORE YOU BUILD

DRY KILNS

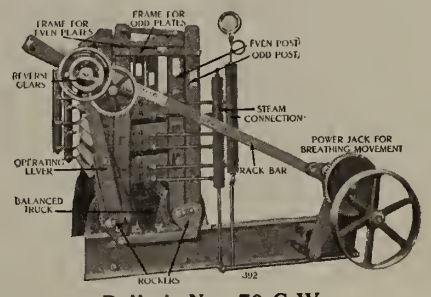
Investigate the merits of our system. Catalog and layouts mailed on request.

Curtis-Hosey Dryer Co. of Canada
177-179 Duke Street, MONTREAL, P.Q

MERRITT ENGINEERING AND SALES COMPANY LOCKPORT N.Y.

MESCO

It pays to install a "Merit" Re-drieer



Bulletin No. 70-C W

Re-drying Veneer

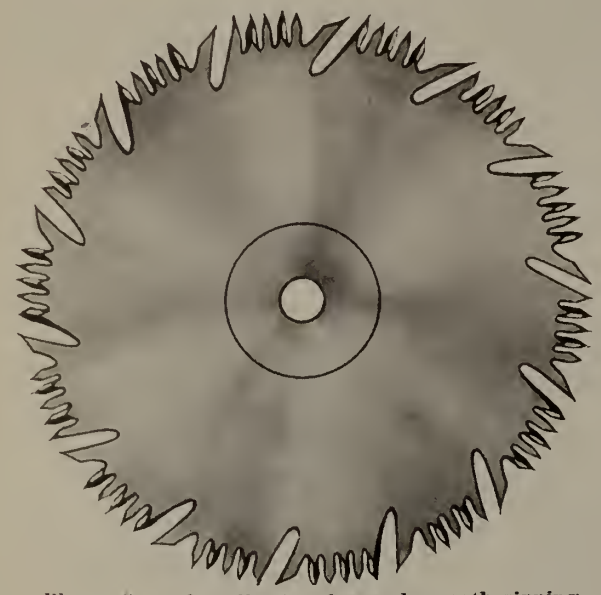
Was not practiced to any extent 10 years ago when the "Merit" re-drier made its appearance on the market. Today very few glue rooms take a chance on veneer that has not been redried under hot plates and very few plants using veneer have neglected to install a "Merit" re-drier. This machine flattens the veneer and makes it absolutely bone-dry. It takes very little steam and is operated by a 2-h.p. motor. It saves glue, simplifies taping and jointing and insures success in the finished product. It is made in several sizes of plate and starting with 4 plates, a machine can later be expanded to 12 or 16 plates.

The "Merit" Line

Veneer Lathes, clippers, driers and re-driers.
Plywood and panel machinery.
Basket and crate machinery.

MERIT

More Accurate Work and Longer Service



Planer Saws for all trimming and smooth ripping.

"Beaver" Brand Hollow Ground Mitre or "Planer" Saws are without equal for smooth cutting. They do not burn and will stand maximum feed. Made with all cutting teeth for X cutting only or as shewn, for rip or X cut work. Do not confound our "Planer" saw with ordinary novelty saw, as they are entirely different in their work, being ground so as to take fast feed, as well as to do smooth work.

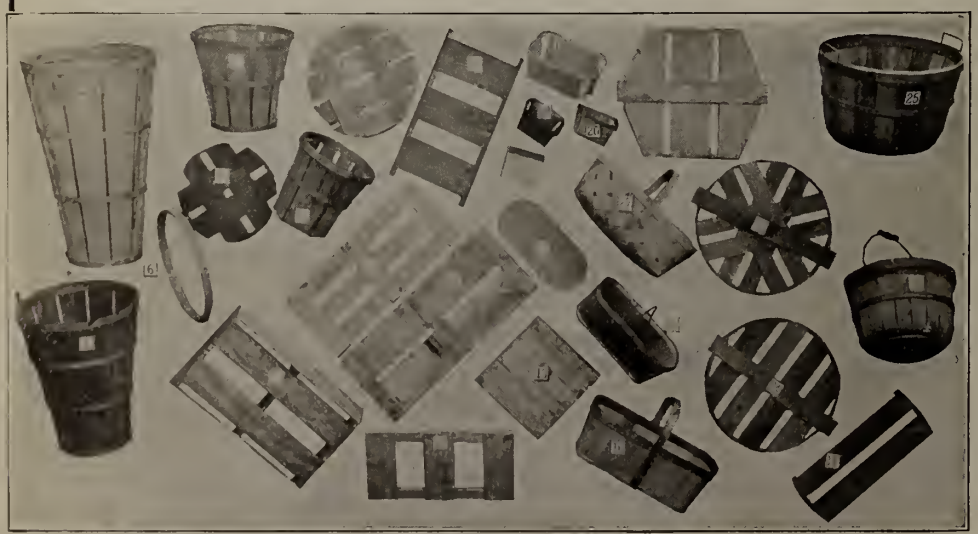
Groover Saws used on shaper or saw table.

Radcliff Saw Manufacturing Company, Limited

1550 Dundas Street West **TORONTO, ONT.**

AGENTS FOR L. & I. J. WHITE CO., MACHINE KNIVES

THIS IS THE NAME



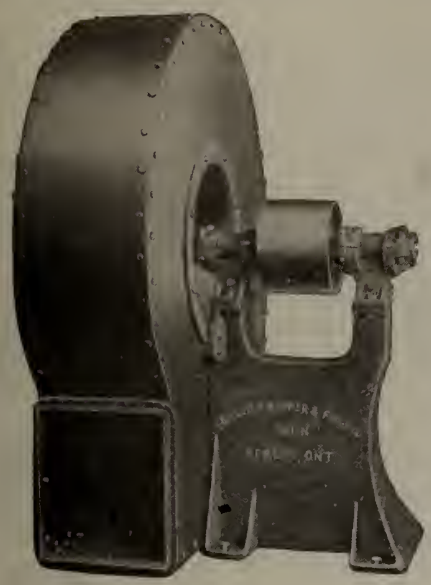
of the Machinery for the Rapid Production of

Veneer—Crates—Baskets—Fruit Packages.

"St Joe"

Get the name fixed in your mind.

ST. JOSEPH IRON WORKS, St. Joseph, Michigan



Canadian Planing Mill Exhauster

Keep your shop clean, remove your sawdust, shavings, or other loose material.

A clean shop with machines free from shavings, chips or sawdust makes for greater efficiency.

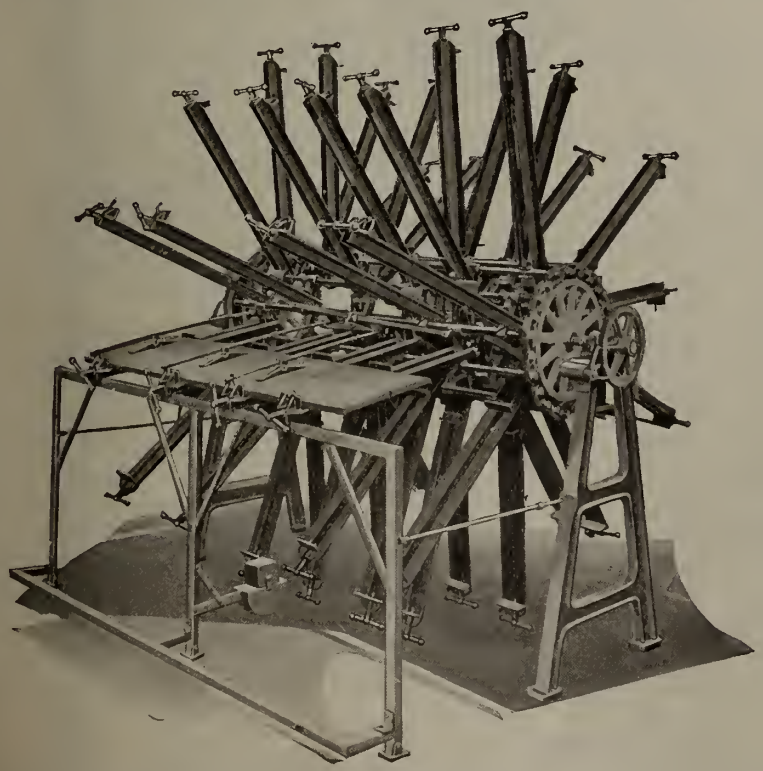
Let our engineering department help you plan your refuse exhaust system.

Write for Catalogue 400-13

Canadian Blower & Forge Co.

KITCHENER, ONT.

Speed + Perfect Joints = Low Costs



The Taylor TRADE MARK

CLAMP CARRIER

for

Small Jobs in the Big Plant
All Jobs in the Little Plant

1. Natural standing position of operator.
2. No Juggling of heavy clamps.
3. No bending or walking.
4. No pile to overturn to get work glued first—simply move clamp one section.
5. Less space than equal number of clamps with work in, piled on the floor.

Any size to suit your work. 8 and 12-section wheel type. 16, 20, 30 and 40-section chain type. 4, 5 or 6 clamps per section for stock up to 42-in. wide.

Representatives:
A. R. Williams Machinery Co., Toronto, Canada

James L. Taylor Mfg. Company
Poughkeepsie, N.Y., U.S.A.

NASHUA Veneer Tapes

Are manufactured with a view to giving the consumer the material for his purpose, and we stand ready to develop any special requirement for you.

In purchasing our tapes you are assured of prompt service, guaranteed quality and a reasonable price.

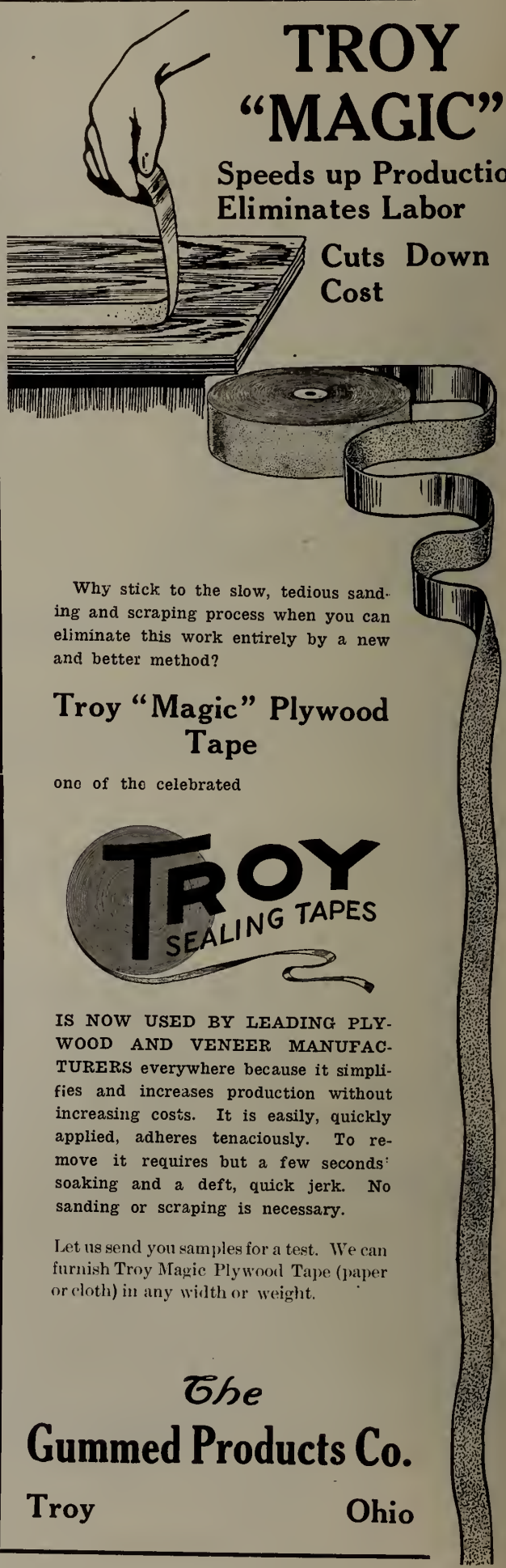
Samples of our stock will be sent upon request, so that you may try them out in your plant in a practical way.

CLOTH and PAPER
Guaranteed Veneer Tapes

THE CANADIAN NASHUA PAPER CO., Ltd.
Peterborough, Ont.

TROY "MAGIC"

Speeds up Production
Eliminates Labor
Cuts Down Cost



Why stick to the slow, tedious sanding and scraping process when you can eliminate this work entirely by a new and better method?

Troy "Magic" Plywood Tape

one of the celebrated

TROY SEALING TAPES

IS NOW USED BY LEADING PLYWOOD AND VENEER MANUFACTURERS everywhere because it simplifies and increases production without increasing costs. It is easily, quickly applied, adheres tenaciously. To remove it requires but a few seconds' soaking and a deft, quick jerk. No sanding or scraping is necessary.

Let us send you samples for a test. We can furnish Troy Magic Plywood Tape (paper or cloth) in any width or weight.

The
Gummed Products Co.
Troy **Ohio**

Perkins Vegetable Glue

The Picture Shows The Present Home of

PERKINS 183

TRADE MARK (Reg. U.S. Pat. Off.)

The Solution to All Glue Room Troubles

We will not lower the standard which we ourselves have set and you cannot afford to use anything but the best. Labor costs for poor glue should go into glue costs. Add to your Vegetable Glue Costs your labor bill for allowances on returned goods on account of defective glue; divide that by your output and your "glue line" cost looks different. Add to that cost the indeterminate figure represented by factory troubles and "general irritation" and you will decide that good old PERKINS 183 is the best in the long run.

Process and Product Patents covering PerkinsGlue were granted July 2nd and March 19th, 1912, and have been held valid and infringed by the United States Circuit Court of Appeals. Patents have also been granted in Canada, Great Britain, France, Belgium, Italy and other foreign countries.

PERKINS GLUE COMPANY

Factory and General Offices:
Lansdale, Pennsylvania

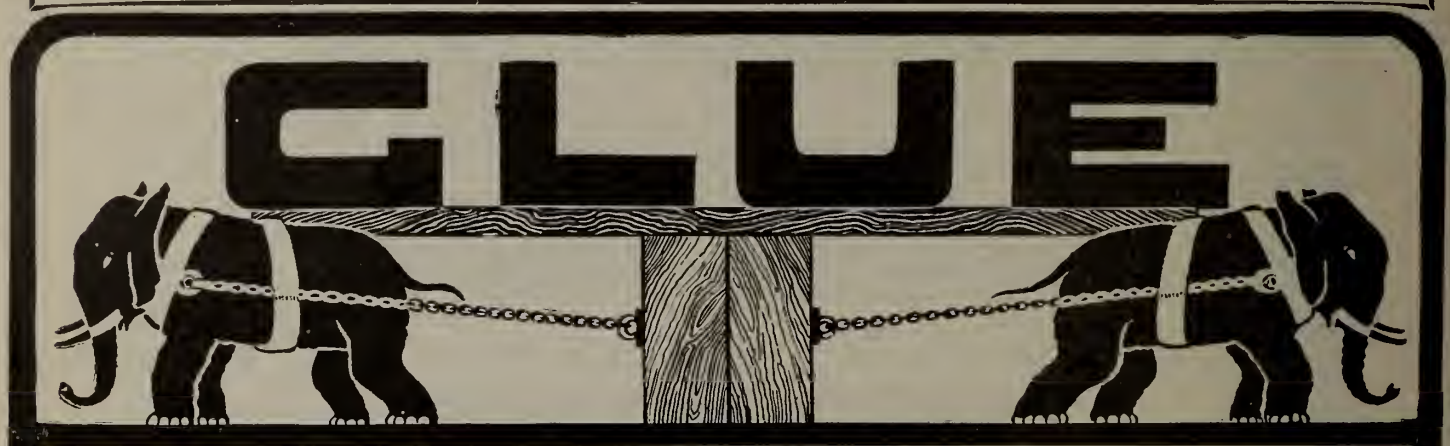
Sales Office:
South Bend, Indiana

Glued up Lumber Cores

Chestnut Gum Poplar Crossbanding—Center Stock

ROTARY CUT **POPLAR and GUM** VENEERS

JOHN KRAMER 729 Sixth Ave., **New York**



FOR THE FINEST CABINET WORK AND VENEERING.

Suitable for All Climates.
Great Strength & Light Colour.

SAMPSON & WHITE, Ltd.
6, HOLBORN VIADUCT, LONDON, E.C.

L. D. MURRELLE LUMBER COMPANY

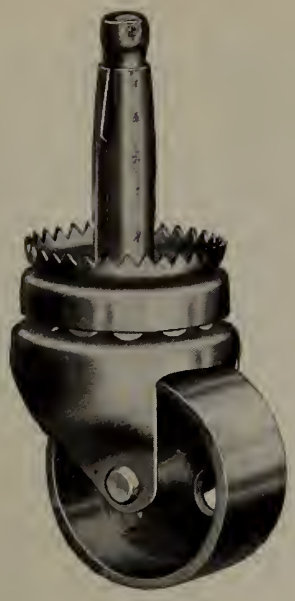
BAND MILL : BUDE, MISS.

General Sales Offices : 1524 Exchange Building, Memphis, Tenn.

A few Specials :
130,000 ft. 4-4" No. 1 and No. 2 Com. Qtrd. White Oak
85,000 ft. 4-4" No. 1 and No. 2 Com. Qtrd. Red Oak
100,000 ft. 4-4 No. 1 and No. 2 Com. Plain Red Oak

Manufacturers of White and Red Oak, Poplar, Gum, Ash, Magnolia and Beech

We Specialize in Quartered WHITE OAK and POPLAR



An Efemco Product

To Give Greater Value to Good Furniture

That's the mission of EFEMCO Castors — with their strong bull-dog construction, trim appearance, free, easy action and rugged all 'round dependability. Their capacity for withstanding heavy loads and tilting strains is *exceptional.*

The EFEMCO Atlas Roller Bearing Castor— shown above — can be furnished with maple, lignum vitae, steel, iron or fibre wheels. Non plated, nickel plated or brass plated. Has steel horn and remarkably strong axle and roller.

Builders of good furniture approve EFEMCO Castors for their fine appearance, as well as for their reliability

Write for catalogue showing new lines of improved EFEMCO Castors

FOSTER, MERRIAM & CO.

Meriden, Conn. Hamilton, Ontario New York City

Efemco PRODUCTS

Grip Neck Casters
Ball Bearing Casters
Roller Bearing Casters
Truck Casters
Automobile Accessories
Piston Rings
Grey Iron Castings

Standardized by 86 years of service

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GUARANTEED RADFORD MILLWORK

MADE IN CANADA

DOORS and WINDOWS

MADE IN CANADA

Made from the best of Kiln Dried Lumber

Our facilities for

DETAIL MILLWORK

are unexcelled

Estimates Gladly Furnished

Radford, Wright, Wilson Company Limited

Winnipeg Moose Jaw

MILL PIPING

Shaving and Sawdust Collecting Systems Installed Complete

ALTERATIONS—REPAIRS

Neville-Cooper Co.
130 Ontario St. Toronto
Phone Main 2157

We also manufacture and erect Smoke Stacks, Boiler Breechings, Metal Cornices, Skylights, Eavetrough, etc.

"CASCO" Waterproof Glue

Mixed Cold—Used Cold

Simple to prepare—can be applied with your present equipment. Comparative tests have convinced thousands of manufacturers of the merits of "CASCO" for jointing and veneering, both from the standpoint of quality and cost. Why not let us tell you about it?

The Casein Manufacturing Co.
Manufacturers of Casein Glues for twenty-five years
15 PARK ROW NEW YORK CITY

NOTE. Send for Casco Red Book. It contains much information on glue, veneer and panels.

You can use these on your present kiln;

Spray nozzles, double humidity system, "circulators", etc., which are described in our literature. They give splendid results and *THEY ARE FEATURES OF*

THE STANDARD DRY KILN

The Standard Dry Kiln Co., 1542 McCarty St. Indianapolis, Ind.

The Very Heart of Your Output

is to be found in your Power Plant. And a leaky, worn out wasteful Boiler makes a "bad heart" for any business. We can make you a proposition for new modern Boiler equipment to-day that will astonish you.

A Section of our Boiler Department

Engineering and Machine Works of Canada, Limited

St. Catharines, Ont.

Eastern Sales Offices:
Hall Machinery Co., Sherbrooke Que., and Birk's Bldg., Montreal

Automatic Hole-Cutting Machines

The Wheel and Hole Cutting Machine has four automatic movements, all of which work in perfect unison, performing their functions in clock-like regularity.

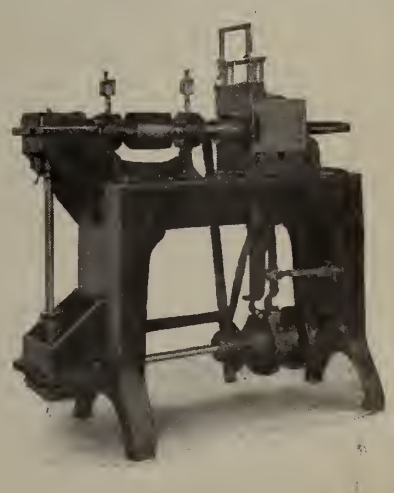
The Hand-Hole Machine will cut hand holes in crate and box ends. It is worked by a carriage and levers, and will cut any size or length hole with either round or bevel edge in any kind of wood.

WRITE FOR NEW DESCRIPTIVE CATALOGUE.

The Virginia Wheel & Hole Sawing Machine Company

S. S. SEE, Manager

14 ThirdStreet N.E. Roanoke, Va



Courtesy Kelton-Aurand Mfg. Co

Art Fibre

Art-Fibre is all that its name implies. Spun from the finest quality of sulphite stock, its smooth uniform surface produces results when properly finished, that correlates with the most artistic designs and the finest quality of upholstering materials.

Because of its known reliability, economy, and excellent quality ART FIBRE SERVES BEST.

Samples and prices sent upon request.

GRAND RAPIDS FIBRE CORD CO.
Grand Rapids, Michigan

Hardwoods

The Quality Kind

Our products are carefully selected, properly manufactured and rigidly graded. In buying them you are assured quality at an attractive price. Give us the opportunity of quoting on the following: Soft Oak (plain and quartered) Poplar, Walnut, Chestnut, Ash, etc. Prompt shipment and satisfaction assured.

Try a mixed or straight carload.

Canadian Representative:
A. E. KLIPPERT,
11 LAXTON AVE.,
TORONTO, ONT.

Leland G. Banning,
CINCINNATI, OHIO

Watchful Waiting!!!

Over a year ago Canada entered upon a business SLUMP. This was followed by a postponement, on the part of the manufacturers, of contemplated Dry Kiln developments.

That is an OLD story—NOW we are approximately back to PRE-WAR prices and business is RAPIDLY returning to normalcy.

Why Continue the Policy of "Watchful Waiting?"

Prices Are Right—Time Opportune

Early spring will see an unusual large amount of new business placed upon the market. IMPROVE your drying facilities NOW and be PREPARED to assume YOUR share of the increase in trade—get in, as it were, on the GROUND FLOOR of business resumption. SOMEONE will get this business—WHY NOT YOU ?

NATIONAL DRY KILNS, as the **very heart** of your productive ability, will enable you to compete on the basis of LOWER COST, SUPERIOR QUALITY and GREATER PRODUCTION. We obtain the greater part of our equipment in Canada, which enables you to secure the MOST UP-TO-DATE and EFFICIENT Dry Kiln at the **lowest possible cost.**

The First Kiln in 6,000 years in which Humidity is Automatically Controlled.

Write To-Day For Catalogue

The NATIONAL DRY KILN CO., 1117 East Maryland Street, Indianapolis, Indiana

or

C. A. Fields, Canadian Representative, P.O. Box 55, TORONTO, Ont.

NATIONAL DRY KILNS

ECONOMY AND RELIABILITY GOES FAR

LACTOCOL

STANDS THE STRAIN

THE COLD WATER GLUE
IN POWDER

REQUIRES NO HEATING OR RE-HEATING. PREPARED IN A MOMENT BY MIXING AN EQUAL VOLUME OF COLD WATER WITH THE POWDER. YOUR GAS BILL BE HALVED AND YOUR OUTPUT CONSIDERABLY INCREASED BY USING LACTOCOL, THE GOVERNMENT APPROVED GLUE.

LACTOCOL IS SPECIALLY ADAPTED FOR GLUEING LARGE SURFACES, AS IT DOES NOT SET PREMATURELY LIKE CAKE GLUES. IT CAN BE USED FOR THE MOST DELICATE OPERATION OR FOR THE LARGEST WORK WITHOUT THE POSSIBILITY OF FAILURE.

ALL JOINTS MADE WITH LACTOCOL ARE WATERTIGHT AND UNAFFECTED BY HEAT. IT IS GUARANTEED TO WITHSTAND A STRAIN OF CONSIDERABLY MORE THAN 1,000 LBS. PER SQUARE INCH. IT SETS HARD AND THE JOINT IS STRONGER THAN THE WOOD. LACTOCOL IS EASILY APPLIED, GOES A LONG WAY, AND IS PERFECTLY RELIABLE.

Used for all classes of Joinery and Builders' Work either inside or outside, Cabinet Making, Parquet Floors, Wooden Tanks and Receptacles, Upholstering, Built-up Mouldings and Cornices, Carriage Building, etc., etc.

LACTOCOL WAS APPROVED BY THE GOVERNMENT FOR CLASS 1 AIRCRAFT CONSTRUCTION.

Test it against the Glue you are now using. Lactocol has proved itself to be the best and most economical of all. LACTOCOL is used extensively in Canada in the mass production of joinery work.

Manufactured solely by

LACTOCOL LTD., 2 STUDLEY ROAD, LONDON, S.W. 4.

A Few Recent Testimonials

UNION FOUNDRY AND MACHINE WORKS, Limited
(Successors to Allan's Foundry)
Office: 909 Duke Street
Saint John, West, N.B., Aug 2nd, 1921.

Holloway, Randell & Co., Ltd.,
Halifax, N.S.

Gentlemen,—

Your favor July 30th to hand. We received tin of glue and have found it to give the best satisfaction we have had yet.

We are now glueing up a large friction and will let you know later how everything turns out.

Yours very truly,
THE UNION FOUNDRY & MACHINE WORKS, Limited,
Per M. E.

SAINT JOHN IRON WORKS (Limited)
Office and Works: Vulcan Street
Marine and Mill Machinery, Boilers, Tanks, etc.,
Iron and Brass Castings.
Saint John, N.B., August 3rd, 1921.

Messrs. Holloway, Randell & Company, Limited,
Halifax, N.S.

Gentlemen,—

Replying to yours of August 1st, we beg to report that we have tested the Lactocol Glue and find it stands up to all tests very satisfactorily. It seems to us that this is the best thing in this line that we have yet had.

Yours very truly,
SAINT JOHN IRON WORKS, LIMITED
HPJ/VMF H. P. Jenkins, Manager.

D. G. KIRK WOODWORKING AND CONTRACTING CO.
ANTIGONISH, N.S., Aug. 3, 1921.

Holloway, Randell & Co., Ltd.,
Halifax, N.S.

Dear Sirs,—

Your favor of July 30th to hand, asking if we found Lactocol Cold Water Glue satisfactory. In reply, we may say that it is perfectly satisfactory. We soaked a glued piece of Douglas Fir for forty-eight hours and we were unable to take it apart.

Yours very truly,
D. G. KIRK WOODWORKING CO. RHD/MD

CHAPPELLS LIMITED
Wood Workers and Builders
SYDNEY, N.S., Aug. 1, 1921.

Messrs. Holloway, Randell & Co., Ltd.,
Halifax, N.S.

Dear Sirs,—

Replying to your communication of July 29th, would say that we have tested out Lactocol Cold Water Glue and up to the present are entirely satisfied with results in connection with its adhesive qualities. Another feature which Lactocol has is its price, which we find compares favorably with the ordinary glue on the market; the initial cost is a little more, but on account of its economic quality, we find it is cheaper in the long run.

Yours truly,
CHAPPELLS LIMITED
Per M. R. Chappell.

MRC/M

THE DOUGLASS FULLERTON COMPANY
Limited
Iron Founders and General Machinists
Pattern Work a Specialty
DARTMOUTH, N.S., June 20th, 1921.

Messrs. Holloway, Randell & Co.,
Halifax, N.S.

Gentlemen,—

We have given your Lactocol Cold Water Glue some very severe tests, namely, joining two pieces of teak, which, owing to its oily nature, makes it almost impossible to join satisfactorily with ordinary glue; also we joined a piece of hemlock to white birch, which withstood heavy hammer blows, and after being submerged in sea water for over 12 hours, still clung together as tight as ever.

We, after making these tests, highly recommend this glue for any kind of woodwork.

Yours very truly,
THE DOUGLASS FULLERTON CO., LTD.
Per H. B. Douglass.

HBD/AJD

Your enquiries solicited.

HOLLOWAY RANDELL & CO. LTD. Sole Canadian Distributors **HALIFAX, N.S.**

Upholstered Furniture Manufacturers Attention!

Carved
Ball
Feet

CHESTERFIELD TRIMMINGS

MOULDINGS and other suitable Fibre Wood Carvings at attractive prices

Your requirements are our only limits as to what can be produced in Fibre Wood Carvings

MADE IN CANADA

J. WALTER & SONS LIMITED

KITCHENER :-: ONTARIO

SAM D. SMITH

Wholesale Dealer and Manufacturer in

NORTHERN and SOUTHERN HARDWOODS

305 Kent Building, Toronto

Specialty—Sawing Dimenison Stock to Order

The Hyde Lumber Co.

Band Mills: LAKE PROVIDENCE LA.
Southern Office: MEMPHIS, TENN.
Bank of Commerce Bldg.
Northern Office: SOUTH BEND, IND.

MANUFACTURERS

Plain Red Gum
Quartered Red Gum
Plain Sap Gum
Quartered Sap Gum
Cottonwood, Cypress
Tupelo, Ash, Elm, Oak

CHARLES O. MAUS
Canadian Representative

Chas. F. Luehrmann Hardwood Lumber Co.

Manufacturers and Wholesalers of

Hardwood and Yellow Pine Lumber

Office and Yard: 148 Carroll St. St. Louis, Mo

Hardwood and Yellow Pine for Immediate Shipment from Stock

Complete Stock of Built Up Panels
3 and 5 Ply—Carried in Stock at St. Louis

FIR DRAWER BOTTOMS
FIR DOOR PANELS

Write us for our Stock and Price List

Quality Lumber Guarantees Value Received

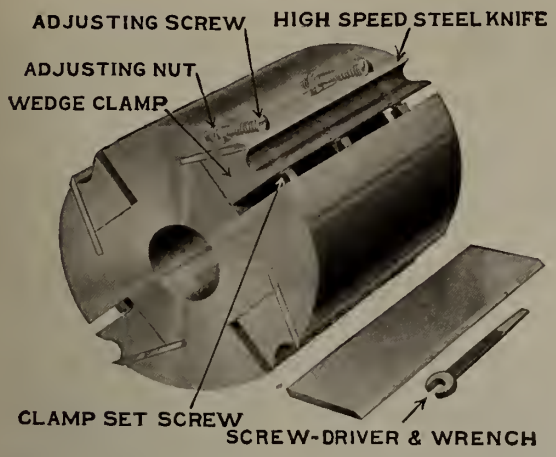
DIRECT MILL SHIPMENTS

We specialize in strictly high grade choice hardwoods Your inquiries respectfully solicited

PROMPT SERVICE ASSURED

GENERAL HARDWOOD LUMBER COMPANY

118 North La Salle Street, Chicago, Illinois

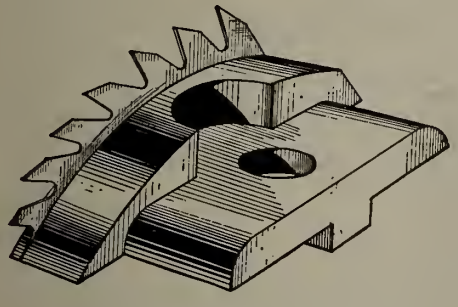


The PORTER "C" Slip-on-Head for Shapers, Jointers and Moulders will cut straight or cross grain without tearing. Irregular shaped knives can be used as well.

There are over 3,000 of these Heads in daily use.
Write for circular and quotation.

C. O. Porter Machinery Co.
GRAND RAPIDS, MICHIGAN, U.S.A.

The Shuff Sticker Saw Head Attachment



Canadian Patent No 212337

This attachment will double your moulder production, widening its range of performance and effecting a real saving in the running of pully stiles, blind stops, cove, parting stops, window stops, fillet, glass bead, base moulding, ceiling, lattice moulding, screen moulding, base shoe, quarter round, stools, panel moulding, etc. Used for splitting moulding when two or more are run at the same time, a decided improvement over the flat knives for this purpose ; also used for rabbeting and grooving.

The attachments are furnished in pairs of rights and lefts, are made of solid brass, each pair properly balanced and saws sharpened and set before shipment. Made in all sizes to fit any moulder. When ordering send sketch of end view of sticker head. Cut smooth and are easily set up. Price $30, 00 in American funds f.o.b. Waukesha, Wis.

Manufactured by

JOHN SHUFF P.O. Box 45, 145 Barstow St. Waukesha, Wis.

American Hardwood Lumber Co.

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Large stock of—

Dry Ash, Quartered Oak Plain Oak and Gum

Shipments from — NASHVILLE, Tenn., NEW ORLEANS, La., and BENTON, Ark.

Do Not Gamble on Your Veneer Tapes

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We have several qualities, cloth and paper, plain and perforated, which will cover all of your requirements.

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Main Offices and Mills, BROOKFIELD, Mass

Aromatic Tennessee Red Cedar

CAR LOAD LOTS OR LESS

Earthman Lumber Co.
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Northern and Southern Hardwoods

We make a Specialty of

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We solicit your inquiries regarding lumber of any kind

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201-2-3 Board of Trade Bldg.,

Montreal

Special Items of Interest

for Prompt Shipment

WHITE ASH			
11,000′	4/4	No. 2 C&B	
BROWN ASH			
60,000′	4/4	No. 1 C&B	
16,000′	6/4	No. 1 C&B	
8,900′	8/4	No. 1 C&B	
BASSWOOD			
75,000′	4/4	Sel. & Fas.	
100,000′	4/4	No. 1 & 2. Com.	
75,000′	6/4	No. 1 Com. & FAS	
50,000′	6/4	No. 2 Com.	
40,000′	8/4	No. 1 C&B	
MAPLE			
75,000′	4/4	Log Run	
BEECH			
65,000′	4/4	Log Run	
BIRCH			
30,000′	4/4	FAS	
90,000′	4/4	No. 1 Com.	
150,000′	4/4	No. 2 Com.	
30,000′	5/4	No. 1 Com. & FAS	
45,000′	6/4	FAS	
60,000′	6/4	No. 1 Com.	
75,000′	6/4	No. 2 Com.	
100,000′	8/4	Sel. & Fas.	
150,000′	8/4	No. 1 Com.	
100,000′	8/4	No. 2 Com.	
75,000′	10/4	Sel. & Fas.	
125,000′	10/4	No. 1 Com.	
250,000′	12/4	Sel. & Fas.	
100,000′	16/4	Sel. & Fas.	
SOFT ELM			
45,000′	4/4	No. 2 C&B	
21,000′	6/4	No. 1 C&B	
22,000′	8/4	No. 1 C&B	
150,000′	4/4	Basswood, Birch, Ash, Elm Under National Rules.	No. 3 Com.

Hardwoods

We can furnish you immediately Factory Stock including all grades and thicknesses of

Walnut, Chestnut Mahogany, Teak, Oak Ash, Cypress

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Limited

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Hardwood Dowels

Plain, Straight and Spiral Grooved

"Canada Wood" dowels are manufactured from high-grade Maple, Birch, Beech or White Oak, uniform in length and nicely pointed, quality guaranteed.

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Sawmills at Zebra and Orillia, Ont.

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Birch, Maple, Elm, Ash and Basswood

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Hard & Soft Maple
Rock & Soft Elm
Beech & Birch
Basswood
Hardwood, in 4x4, 4x6, 1" & 2" No. 3 Com.

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The Pedwell Hardwood Lumber Company

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Stock on Hand in Kitchener for Immediate Shipment

3,000	ft.	4/4 x 10 in. and up Qt'd White Oak Fas.
12,000	"	4/4 x 6 in. and up Qt'd White Oak Fas.
15,000	"	4/4 x 6 in. and up Qt'd White Oak No. 1 com.
2,680	"	3/4 x 13/17 Sap Gum Fas.
4,700	"	3/4 x 3/12 Sap Gum No. 1 Com.
400	"	5/4 x 6 in. Plain red Gum Fas.
4,000	"	4/4 x 6 in. up Sap Gum No. 1 Com.
5,000	"	8/4 x 6 in. up Qt'd red Gum C. & B.
8,000	"	5/4 x 6 in. Plain White Oak Fas. ... ...
2,000	"	6/4 x 4 in. Plain White Oak No. 1 Com.
15,000	"	6/4 x 6 in. Plain red Oak Fas.
10,000	"	8/4 x 6 in. Plain red Oak Fas.
25,000	"	8/4 x 4 in. Plain red Oak No. 1 Com.
12,000	"	4/4 x 3 in. Tenn. Red Cedar No. 1 C. & B.
25,000	"	8/4 Sound Wormy Chestnut
2,000	"	5/4 Sount Wormy Chestnut
32,000	"	6/4 Sound Wormy Chestnut
5,000	"	4/4 Chestnut No. 1 C. & B.
10,000	"	5/4 Chestnut No. 1 C. & B.
10,000	"	6/4 Chestnut No. 1 C. & B.
43,000	"	4/4 Soft Elm No. 3 C. & B.
1,000	"	4/4 Soft Elm No. 3 Common
12,000	"	8/4 Soft Elm No. 2 C. & B.
15,000	"	12/4 Soft Elm No. 2 C. & B.
5,285	"	12/4 Oak No. 2 Common & Better
6,000	"	12/4 Oak No. 2 and 3 Common
12,000	"	4/4 Hard and soft Maple No. 3 C. & B.

PERCY E. HEENEY

Office: 298 Breithaupt St., KITCHENER, ONT.

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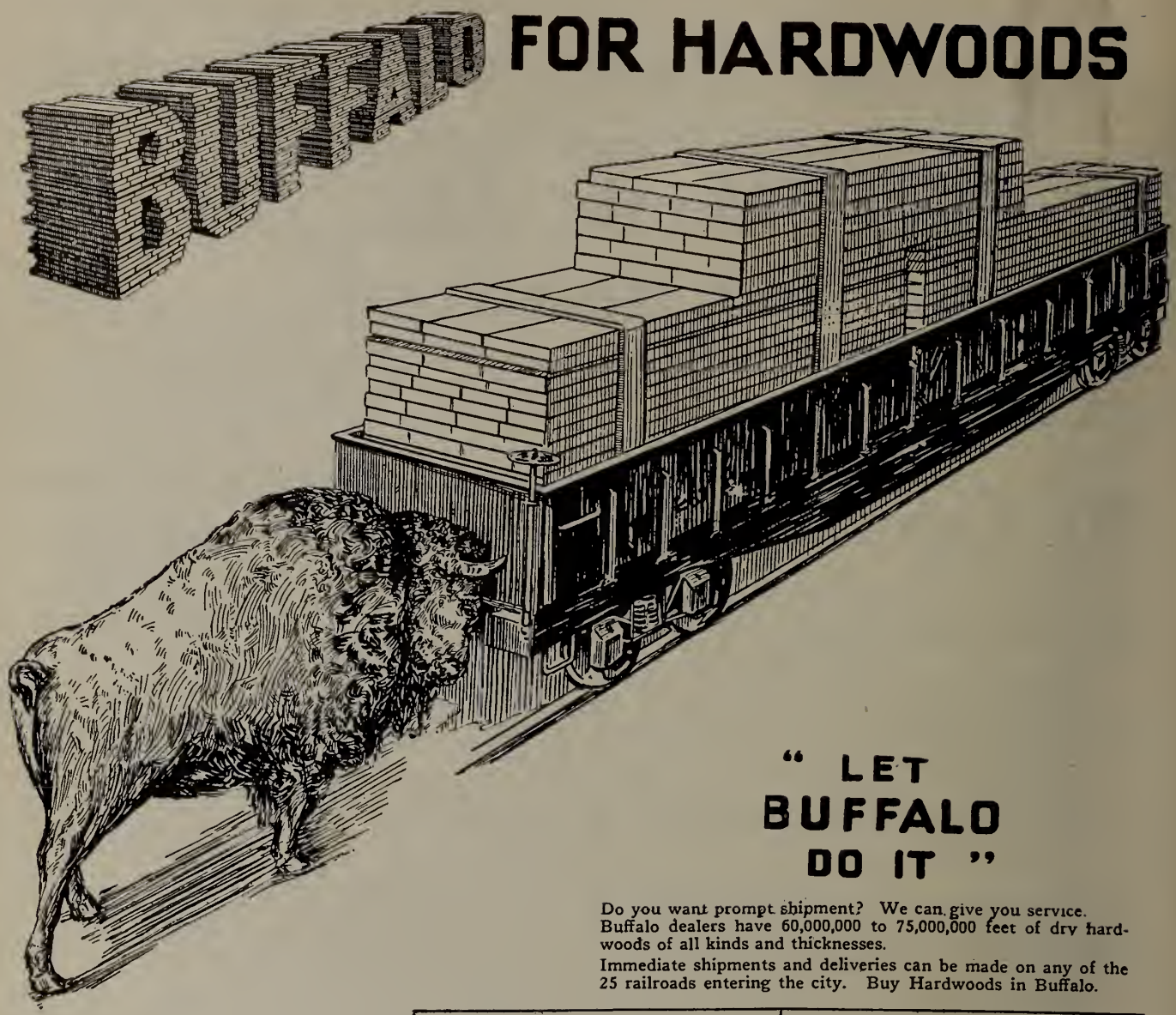
A Large Factory equipped with up-to-date machinery is at your service to furnish "WHAT YOU WANT"— WHEN YOU WANT IT."

YOUR ENQUIRIES SOLICITED

Orillia Ontario Canada

BUFFALO FOR HARDWOODS



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Immediate shipments and deliveries can be made on any of the 25 railroads entering the city. Buy Hardwoods in Buffalo.

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Specialties:
CHERRY, WALNUT and PACIFIC COAST WOODS
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T. Sullivan & Company
NORTHERN GREY ELM
and
BROWN ASH
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Atlantic Lumber Company
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SPECIALTIES
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Hardwoods
Prompt Shipmeot: From Buffalo Yards or from Mill direct to you
8 MILLION FEET DRY STOCK ON HAND
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G. Elias & Bro., Inc.
Established 1881
All Kinds of Hardwood Lumber
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Careful attention to mixed car orders.

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We Specialize in White Ash, Oak & Maple
We also handle a complete stock of Quartered Oak, Maple, Poplar, Red Cedar, etc.

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Hardwoods of All Kinds
A stock of 18,000,000 to 20,000,000 feet of hardwoods carried at all times at our two big Buffalo Yards
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A Complete Stock of Seasoned Hardwoods
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Furniture,
Desk and Table
Manufacturers

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is well and favorably known in Canada as well as the States and its use in the form of Tops, Drawer Fronts, End Panels etc., in your product, will be a long step in securing the confidence of your customers which will result in orders and re-orders.

Our trademark is stamped on the back of every Top and Panel we make. Our guarantee that it is right and will stay right.

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Oak Tie Siding
White and Red Oak
Yellow Poplar
Basswood
Chestnut and
Gum Lumber.

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Vice President and Manager of Lumber Dept.

Peytona Lumber Co. Inc.

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Band Sawed West Virginia Hardwoods

WHITE OAK	BASSWOOD
RED OAK	MAPLE
CHESTNUT	BEECH
POPLAR	HICKORY

Our own facilities for Surfacing, Resawing and Kiln Drying

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JOHNSON CITY, TENNESSEE

1 Band Mill — *5 Circular Mills*

Hardwood Lumber

Oak	Basswood
Maple	Buckeye
Chestnut	Poplar
Ash	Birch

Rotary-Cut Soft Yellow Poplar Veneers
Quarter-Sawn White Oak Flitches
Sliced and Sawn Quartered White OakVeneers
Oak and Maple Flooring
Dowel Pins and Dowel Rods
Glued-Up Chestnut Cores and Dimension

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Ash—Plain and Qtd.
White and Red Oak
Poplar, Cypress, Gum

In addition to stocks at Mill, we carry a well assorted dry stock of all items on our St. Louis yard available for immediate shipment. Write or wire us (our expense) for quotations.

F. HUNTINGTON SMITH

Canadian Representative

Miller Lumber Company, Marianna, Arkansas, U. S. A.

Manufacturers of Southern Hardwoods

		Quantity
QUARTERED WHITE OAK		
4/4	FAS	15,000
4/4	FAS	50,000
5/4	FAS	25,000
6/4	FAS	2,000
6/4	FAS	15,000
8/4	FAS	20,000
4/4	No. 1 Com.	400,000
5/4	No. 1 Com.	12,000
6/4	No. 1 Com.	4,000
6/4	No. 1 Com.	5,000
8/4	No. 1 and 2 Com.	6,000
4/4	No. 2 Com.	100,000
PLAIN WHITE OAK		
4/4	FAS	18,000
4/4	FAS	40,000
5/4	FAS	10,500
8/4	FAS	5,000
4/4	No. 1 Com.	300,000
4/4	No. 1 Com.	200,000
5/4	No. 1 Com.	30,000
6/4	No. 1 Com.	40,000
8/4	No. 1 Com.	40,000
4/4	No. 2 Com.	250,000
4/4	No. 2 Com.	100,000
5/4	No. 2 Com.	8,500
6/4	No. 2 Com.	10,500
8/4	No. 2 Com.	15,000
QUARTERED RED OAK		
4/4	No. 1 and 2 Com.	35,000
4/4	No. 1 and 2 Com.	50,000
PLAIN RED OAK		
4/4	FAS	60,000
5/4	FAS	30,000
8/4	FAS	18,000
4/4	No. 1 Com.	500,000
4/4	No. 1 Com.	200,000
5/4	No. 1 Com.	33,000
6/4	No. 1 Com.	11,000
8/4	No. 1 Com.	32,000
4/4	No. 2 Com.	600,000
4/4	Sound Wormy	100,000
4/4	No. 3 Com.	500,000
5/4	No. 3 Com.	32,000
6/4	No. 3 Com.	15,000
MISCELLANEOUS OAK		
4/4	3-5½″ clr. Pl. Wh.O. Strips	5,000
4/4	3-5½″ clr. Pl. R.O. Strips	5,000
4/4	2-5½″ clr. Qt. W.O. Strips SND	15,000
5/4	Pl. R.O. Step Plank, 11″ & up.	11,000
8/4	R&W O. Bridge Plank	75,000
10/4	R&W O. Bridge Plank	15,000
12/4	R&W O. Bridge Plank	15,000
QUARTERED RED GUM		
5/4	No. 1 C&Btr.	15,000
6/4	No. 1 C&Btr.	19,000
8/4	No. 1 C&Btr.	22,000
5/4	No. 1 Com.	13,000
PLAIN RED GUM		
4/4	FAS	58,000
6/4	FAS	8,700
6/4	No. 1 Com.	3,700
SAP GUM		
4/4	9-12″ Bx. Bds.	63,000
4/4	9-12″ Bx. Bds.	50,000
4/4	13-17″ Bx. Bds.	56,000
4/4	18″ & up Pan & W No. 1	4,200
4/4	6-12″ FAS	50,000
4/4	13-17″ FAS	40,000
4/4	13-17″ FAS	50,000
5/4	No. 1 C. & Btr.	134,000
6/4	No. 1 C. & Btr.	83,000
4/4	No. 1 Com. Sap	200,000
4/4	No. 1 Com. Sap	200,000
5/4	No. 1 Com.	9,000
6/4	No. 1 Com.	5,000
TUPELO		
4/4	6-12″ FAS	21,000
4/4	13-17″ FAS	4,600
4/4	9-12″ Bx. Bds.	6,800
4/4	13-17″ Bx. Bds.	2,300
4/4	No. 1 Com.	45,000
ASH		
5/4	No. 1 C. & Btr.	1,300
8/4	No. 1 C. & Btr.	20,000
10/4	No. 1 C. & Btr.	15,000
12/4	No. 1 C. & Btr.	15,000
COTTONWOOD		
4/4	FAS 6-12″	110,000
4/4	FAS 13-17″	27,000
4/4	18″ & up Pan. & W. No. 1	9,900
4/4	9-12″ Bx. Bds.	32,000
4/4	13-17″ Bx. Bds.	20,000
4/4	No. 1 Com.	100,000
4/4	No. 1 Com.	50,000
4/4	No. 2 Com.	100,000
4/4	No. 2 Com.	50,000
ELM		
4/4	No. 1 C. & Btr.	69,000
6/4	No. 1 C. & Btr.	42,000
8/4	No. 1 C. & Btr.	15,000
10/4	No. 1 C. & Btr.	36,000
12/4	No. 1 C. & Btr.	32,000
MAPLE		
4/4	Log Run	74,000
5/4	Log Run	62,000
6/4	Log Run	12,500
8/4	Log Run	100,000
8/4	Log Run	100,000
SYCAMORE		
5/8″	No. 2 C. & B. Qtd.	30,000
4/4	No. 2 C. & B. Qtd.	138,000
4/4	No. 1 C. & B. Pl.	150,000
4/4	No. 1 C. & B. Pl.	150,000
CYPRESS		
4/4	FAS	6,500
5/4	FAS	10,000
6/4	FAS	11,000
8/4	FAS	15,000

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Dry Lumber in Buffalo for Quick Shipment

TENNESSEE SCENTED CEDAR

1″	74,000 ft.
1¼″	5,000 ft.

CHERRY

	1 & 2	No. 1 Com.	No. 2 Com.	No. 3 Com.
1″	112,500	176,900	45,500	58,000
1¼″	5,900	33,600	12,500	26,900
1½″	3,000	47,700	36,300	38,000
2″	8,000	22,200	64,900	9,500
2½″	6,500	3,300	2,200	.....
3″	25,700	4,500	3,300	.....
4″	5,900	.....	400	.....

CHESTNUT

	1 & 2	Clear Strips	No. 1 Com.	S.W. & No. 2 Com.
¾″	1,000	.....	51,000	103,000
1″	36,000	1,000	17,000	89,000
1¼″	151,000	300	80,200	199,200
1½″	77,500	.....	42,000	.....
2″	16,200	.....	17,300	116,200
2½″	4,000	.....	1,500	500
3″	2,100	.....	1,300	500
4″	1,500	.....	.....	.....

QUARTERED WHITE OAK

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
½″	6,500	.....	.....	.....
¾″	400	300	23,600	9,000
⅝″	2,800	.....	5,500	800
1″	40,300	20,000	49,400	27,000
1¼″	10,000	.....	5,000	.....
1½″	600	.....	2,400	.....
2″	.....	.....	25,100	5,700
2½″	2,000	.....	.....	.....

PLAIN WHITE OAK

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
⅜″	1,000	.....	.....	.....
½″	100	.....	.....	.....
⅝″	9,150	.....	1,000	16,900
¾″	227,800	.....	360,000	112,000
1″	39,300	1,700	86,000	85,200
1¼″	14,300	.....	1,100	5,000
1½″	97,300	.....	66,000	18,000
2″	62,000	.....	117,000	65,000
2½″	164,800	.....	56,500	3,000
3″	77,800	.....	65,800	14,400
3½″	5,500	.....	3,000	1,500
4″	76,000	.....	27,500	6,000

PLAIN RED OAK

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
⅜″	24,200	.....	.....	.....
¾″	204,000	.....	340.000	68,800
⅝″	4,000	.....	77.000	42,600
1″	48,200	3,150	46,000	126,400
1¼″	39,700	2,400	4,600	300
1½″	168,900	4,300	40,200	40,000
2″	110,500	.....	144,000	77.000
2½″	78,100	.....	21,000	3,700
3″	28,800	.....	20,500	7,000
4″	18,600	.....	8,900	.....

QUARTERED RED OAK

	1 & 2	Clear Strips	No. 1 Com.	No. 2 Com.
¾″	1,700	.....	9,700	500
1″	21,200	5,400	2,500	1,400
1¼″	2,000	.....	.....	.....
2″	.....	.....	7,400	.....

SAP GUM

	1 & 2 Com.	No. 1 Com.	No. 2 Com.	No. 3 Com.
1″	16,000	6,000	200	2,100
1¼″	.....	400	.....	12,000
1½″	2,400	6,000	13,500	2,500
2″	.....	5,700	10,400	25,800

QUARTERED SAP GUM

	1 & 2 Com.	No. 1 Com.	No. 2 Com.
4/4	.....	2,500	12,000
5/4	14,000	.....	.....
8/4	22,000	8,000	200
10/4	10,250	23,000	1,800

PLAIN RED GUM

	1 & 2 Com.	No. 1 Com.	No. 2 Com.
1″	29,300	10,000	11,500
1¼″	12,000	11,325	.....
1½″	15,000	17,300	9,500
2″	11,000	2,000	5,500

QUARTERED RED GUM

	1 & 2 Com.	No. 1 Com.	No. 2 Com.
4/4	6,000	12,000	7,000
5/4	13,400	7,800	.....
6/4	9,900	3,500	.....
8/4	22,100	22,500	3,600

POPLAR

	1 & 2	Bright Saps	No. 1 Com.	No. 2 Com.
⅝″	18,000	20,800	31,300	800
1″	41,000	9,200	111,900	78,800
1¼″	24,300	3,700	5,700	19,000
1½″	19,100	13,000	43,000	4,500
2″	.....	.....	12,500	24,500

Also Large Stocks of Ash, Basswood, Beech, Birch, Hard and Soft Maple.

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Will make attractive prices for 4/4 Birch and Elm; immediate shipment. Also have good stock in all thicknesses, Soft & Hard Maple, Ash, and Basswood. Write us for quotations.

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Cypress
For Battery Separators

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Quartered Red Oak
and Other Hardwoods

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Par Excellent

Buyers requiring an exact standard of manufacture plus lumber cut from good timber will find it in our band-sawn White and Red Oak, Ash, Gum and other Arkansas hardwoods.

In addition to affording a reliable source of supply for these items, we also offer you the practical convenience of filling out special schedules with finely manufactured Oak Flooring, square edge parquetry strips, oak trim and moulding, which can be shipped in the same car.

Ours is a service of unusual scope and value, which it will pay you well to investigate.

MEMPHIS BRUCE LITTLE ROCK

Correspondence invited

E. L. BRUCE COMPANY
MANUFACTURERS
MEMPHIS, TENNESSEE
Band Mill: LITTLE ROCK, ARKANSAS
Oak Flooring Plants: LITTLE ROCK; MEMPHIS

We specialize in Birch, Basswood, Hard Maple

A High Standard of Quality and Service

500M	4-4	Unselected	Birch	500 M	4-4	Basswood		500M	4-4	Hard	Maple
300M	5-4	"	"	300M	5-4	"		400	5-4	"	
150	6-4	"	"	200	6-4	"		400	6-4	"	
125	8-4	"	"	75	8-4	"		600	8-4	"	
150	10-4	"	"					400	10-4	"	
150	12-4	"	"					300	12-4	"	
75	14-4	"	"					75	14-4	"	
75	i6-4	"	"					100	16-4	"	

Sawyer Goodman Company

Marinette - Wisconsin

WE ARE TELLING THE PUBLIC: "BE SURE YOUR WALNUT IS ALL WALNUT."

AMERICAN WALNUT

"The Cabinet-wood of Infinite Variety."

WE ARE TELLING THE PUBLIC: "BE SURE YOUR WALNUT IS ALL WALNUT."

"THE AMERICAN WALNUT PERIOD."

Genuine American Walnut richly deserves the secure place it has *earned* in the affections of the American people.

Added to its rare beauty of grain and natural rich brown color, is its historic quality of *permanence*, and the positive assurance of entire freedom from warping, shrinking, twisting or slivering wherever this supreme cabinet-wood is used—interior woodwork, broad panels, fine furniture, etc., or in such exacting service as airplane propellers and gun stocks demand.

"The Cabinet-wood of Infinite Variety."

A superior quality of acumen is displayed by manufacturers who are featuring American Walnut furniture, and also *by those who are buying it.* Our advertising is featuring this slogan—***"BE SURE YOUR WALNUT IS ALL WALNUT."***

May we send you with our compliments the American Walnut Brochure de Luxe? An interesting story of Walnut's history.

AMERICAN WALNUT MANUFACTURERS' ASSOCIATION

ROOM 1019 616 SOUTH MICHIGAN BOULEVARD CHICAGO, U. S. A.

Lumber

Walnut, Mahogany Plain and Quartered Oak, Ash, Cherry

Veneers

Walnut and Mahogany

WE specialize in AMERICAN BLACK WALNUT and can furnish straight cars from 3/8 to 4 inches in thickness. Also can load mixed cars WALNUT and MAHOGANY LUMBER and VENEERS, PLAIN and QUARTERED RED and WHITE OAK, ASH and CHERRY.

The Kosse, Shoe and Schleyer Co.

Eastern Branch:
BALTIMORE, Md.

Main Office and Band Mill:
CINCINNATI, Ohio

"The Canada Lumberman" is published in the interest of, and reaches regularly, persons engaged in the lumber, woodworking and allied industries in every part of Canada. It aims at giving full and timely information on all subjects touching these interests, and invites free duscussion by its readers.

Advertisers will receive careful attention and liberal treatment. For manufacturing and supply firms wishing to bring their goods to the attention of owners and operators of saw and planing mills, woodworking factories, pulp mills, etc., "The Canada Lumberman" is undoubtedly the most direct and profitable advertising medium. Special attention is directed to the "Wanted" and "For Sale" advertisements. Sample copy and full information on request. Head Office, 349 Adelaide St. West, Toronto.

Per year $3 in Canada

Canada Lumberman

founded 1880

The National Lumber Journal for Forty Years

Mailed twice monthly

Toronto Montreal

Winnipeg Vancouver

Reese Sheriff Lumber Co.

WILLIAMSPORT, PENNSYLVANIA

Manufacturers of

Northern and Southern Hardwoods White Pine, Spruce and Hemlock

With special attention to **Oak, Chestnut, Poplar, Cherry, Walnut, Gum and Basswood.**

OUR MOTTO

REASONABLE PRICES – that you can afford to pay.
EFFICIENT SERVICE — that you have a right to expect
FAIR TREATMENT — that you can depend on getting

We would appreciate an opportunity of furnishing a portion of your lumber requirements.

BY MAKING TEST RUNS OF YOUR LUMBER

You will find that our stock will reduce your costs to a minimum and improve the quality of your product. Indiana hardwoods cost no more than the other kinds—then why not use them ?

We are the largest hardwood producers in Indiana and give below a partial list of stock on hand:

INDIANA QUARTERED WHITE OAK

	1s & 2s	No. 1 Com.	No. 2 Com.
1/2"	1 car	1 car	
5/8"	2 "	4 "	
3/4"	1 "	5 "	1 car
4/4"	3 "	4 "	4 "
5/4"	1 "	3 "	1 "
6/4"	1 "	3 "	
8/4"	1 "	2 "	

Also Clear and No. 1 Common Quartered White Oak Strips.

INDIANA QUARTERED RED OAK

	1s & 2s 6" & up	1s & 2s 9" & up	No. 1 Com.	No. 2 Com.
1/2"—3500'				
5/8"—1 car			1 car	
4/4"—3 car		1 car	3 "	1 car
5/4"—2 "		1 "	2 "	
6/4"—2 "		2500'	1 "	
7/4"—1 "		4500'		
8/4"—2000'		3000'	1 "	

PLAIN WHITE OAK

	1s & 2s	No. 1 Com.	No. 2 Com.
5/8"	1 car	1 car	
3/4"		4000'	
4/4"	2 "	4 cars	2 cars
5/4"	1 "	3 "	1 "
6/4"	1 "	2 "	
8/4"	3 "	2 "	
2½"	½ "	1 "	

PLAIN RED OAK

	1s & 2s	No. 1 Com.	No. 2 Com.
5/8"	2 cars	2 cars	
3/4"		5000'	
4/4"	4 "	4 cars	3 cars
5/4"	1 "	3 "	
6/4"	1 "	4 "	
8/4"	2 "	3 "	
2½"	2 "	3 "	

BLACK WALNUT—Steamed Stock

	1s & 2s	No. 1 Com.	No. 2 Com.
4/4"	1 car	3 cars	12000'
5/4"	1 "	1 "	9000'
6/4"	4000'	4000'	
8/4"	1 car	1 car	

1 car 5/8" Log Run, not steamed.

WE ARE IN POSITION TO KILN DRY THIS LUMBER. ASK FOR OUR RATES.

We also have good stocks of Poplar, Ash, Beech, Hickory, Maple, Gum, Tupelo, etc.—Write us for prices.

Maley & Wertz Lumber Company

EVANSVILLE, INDIANA

MILLS AT EVANSVILLE, IND., GRAMMER, IND., and KEIRNS, MISS.

Stimson Veneer and Lumber Co.

(Inc.)

Office and Mill: McLean Ave. and Union Belt R.R.

Memphis - Tenn.

We sell only the product of our own mills and make band sawn lumber in all Southern Hardwoods.

We specialize in Quartered White Oak, Red Oak, and Red Gum.

With allied companies we make fifty million feet annually.

J. V. Stimson Hardwood Co.

Manufacturers and Exporters

Band Mills: Memphis, Tenn., Helena, Ark.

Memphis - Tenn.

STOCK LIST

QUARTERED WHITE OAK
- 3 cars 4/4" 1s and 2s.
- 5 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common .

QUARTERED RED OAK
- 5 cars 4/4" 1s and 2s.
- 10 cars 4/4" No. 1 Common.
- 4 cars 4/4" No. 2 Common.
- 2 cars 6/4" No. 1 Common and Better.

QUARTERED RED GUM
- 10 cars 4/4" 1s and 2s.
- 3 cars 4/4" 1s and 2s Fig.
- 2 cars 5/4" 1s and 2s.
- 2 cars 6/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 2 cars 5/4" No. 1 Common.
- 2 cars 6/4" No. 1 Common.

QUARTERED RED GUM, Sap no Defect
- 5 cars 6/4" No. 1 Common and Better.
- 10 cars 8/4" No. 1 Common and Better.

ASH
- 4 cars 10/4" No. 1 Common and Better.
- 1 car 12/4" No. 1 Common and Better.
- 1 car 6/4" No. 1 Common and Better.
- 2 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common.

SAP GUM
- 10 cars 4/4" 1s and 2s.
- 20 cars 4/4" No. 1 Common.
- 10 cars 4/4" No. 2 Common.
- 2 cars 4/4" 18" up Panel.
- 5 cars 4/4" 13-17" Box Boards.

PLAIN RED OAK
- 2 cars 4/4" 1s and 2s.
- 2 cars 6/4" No. 1 Common and Better.
- 2 cars 10/4" No. 1 Common and Better.

PLAIN WHITE OAK
- 4 cars 4/4" No. 1 Common Plain.

COTTONWOOD
- 2 cars 4/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 5 cars 4/4" No. 2 Common.

ELM
- 2 cars 4/4" Log Run.
- 10 cars 10/4" Log Run.
- 10 cars 12/4" Log Run.

MAPLE
- 4 cars 12/4" Log Run.

Dowels, Turnings, Knobs, Spindles, Buttons, Drawer Stops, Table Pins, Screwhole Plugs. Special Woodwork to order.

No 2 Dowel Pin

HENRY ROWE MFG. COMPANY NEWAYGO, Mich.

DRY STOCK

For Immediate Shipment

	SOFT ELM	
6905′	1″	—No. 1 C&B
3195′	1″	—No. 2 Com.
41030′	1¼″	—No. 1 C&B
2356′	1¼″	—No. 2 Com.
56880′	2″	—No. 1 C&B
10046′	2″	—No. 2 Com.
110594′	2½″	—No. 1 C&B
26985′	2½″	—No. 2 Com.
11750′	3″	—No. 2 Com.
	WHITE ASH	
87846′	2″	—No. 1 C&B
3072′	2″	—No. 2 Com.
139960′	2½″	—No. 1 C&B
13537′	2½″	—No. 2 Com.
18992′	3″	—No. 1 C&B
608′	3″	—No. 2 Com.
	HICKORY	
650′	1″	—No. 1 C&B
1408′	2″	—No. 1 C&B
	COTTONWOOD	
1620′	1″	—No. 1 C&B
19956′	2″	—No. 1 C&B
1196′	2″	—No. 2 Com.
	BLACK WALNUT	
2873′	1″	—No. 1 C&B
1151′	1″	—No. 2 Com.
	WILLOW	
1446′	1″	—No. 1 C&B
	CHERRY	
4747′	1″	—No. 1 C&B
2137′	1″	—No. 2 Com.
	ROCK ELM	
12493′	2″	—No. 1 C&B
	SOFT MAPLE	
14397′	2½″	—No. 1 C&B
	BASSWOOD	
1549′	1″	—No. 1 C&B
606′	2″	—No. 1 C&B
	BUTTERNUT	
2584′	1″	—No. 1 C&B
	HARD MAPLE	
31788′	1″	—No. 1 C&B
243927′	1¼″	—No. 1 C&B
227707′	1½″	—No. 1 C&B
1796′	1½″	—No. 2 Com.
217401′	2″	—No. 1 C&B
11410′	2″	—No. 2 Com.
38016′	2½″	—No. 1 C&B
11091′	3″	—No. 1 C&B
2796′	4″	—No. 1 C&B
	BEECH	
3000′	1½″	—No. 2 Com.
500′	2″	—Log run
250′	2½″	—Log run
350′	3″	—Log Run
100′	4″	—Log run
	BIRCH	
15998′	1″	—No. 1 C&B
22311′	1¼″	—No. 1 C&B
11748′	1½″	—No. 1 C&B
50157′	2″	—No. 1 C&B
87172′	2½″	—No. 1 C&B
7866′	3″	—No. 1 C&B
	PLAIN OAK	
9369′	1″	—No. 1 C&B
1107′	2″	—No. 1 C&B

The above stock is in our Battlecreek yard and we are so located that we can load and ship stock immediately upon receipt of your orders. We guarantee National Hardwood Lumber Association grades.

PAYSON SMITH LUMBER CO.

Plymouth Building - MINNEAPOLIS, Minn.

McLEAN MAHOGANY & CEDAR CO., INC.

American Hardwoods

WE SOLICIT YOUR ENQUIRIES

742 Ellicott Square, Buffalo, N.Y.

OAK

Plain and Quartered

Uniform Color—Soft Texture

Poplar, Ash

and other

Hardwoods

We carry 35,000,000 feet dry stock—all of our own manufacture.

Oak Timbers and Planking

The Mowbray & Robinson Co.

(INCORPORATED)

Manufacturers

Office: CINCINNATI, OHIO

MILLS

Quicksand, Ky.; West Irvine, Ky.

Canadian Representative :

A. K. Johuson, Traders Bank Building, Toronto, Ont

Thompson-Katz Lumber Co.

Manufacturers of

WHITE ASH EXCLUSIVELY

In dealing with us the wood worker and furniture manufacturer may rightly expect a better service, better value and a greater selection from which to choose his requirements. We have all grades and all thicknesses to offer—beautiful stock that we know will please you. Drop us a card to-day—we'll do the rest.

MEMPHIS, TENNESSEE

J. H. Bonner & Sons

Memphis, Tenn.

Mills:
Jonquil and Ruffwood, Ark.

Manufacturers

Band Sawn Hardwood Lumber

Write or wire for prices on

Gum, Oak, Elm, Etc.

Frank Purcell Walnut Lumber Co.

Plenty of logs like the portion of our stock shown above have made possible the million and a half foot stock of well manufactured American Walnut Lumber which we now have to offer.

Prompt shipment
All grades and thicknesses
Guaranteed Inspection

12th AND BELT LINE

Kansas City - Kansas

Nichols & Cox Lumber Co.

GRAND RAPIDS - MICHIGAN

We can ship promptly the following items. Can also kiln dry if desired.

2 cars	4/4	1st and 2nd	Sap Gum
5 "	4/4	No. 1 Com.	"
3 "	5/4	No. 1 Com. and Better	"
2 "	6/4	"	"
2 "	8/4	"	"
4 "	6/4	"	Qtd Sap Gum
8 "	8/4	"	"
3 "	0/4	"	"
2 "	12/4	"	"
2 "	4/4	"	Plain Red Gum
1 "	5/4	"	"
1 "	6/4	"	"
1 "	8/4	"	"
2 "	4/4	1st and 2nd	Plain Red Oak
3 "	4/4	No. 1 Com.	"
1 "	5/4	No. 1 C & B	"
1 "	6/4	"	"
1 "	8/4	"	"
1 "	4/4	1st and 2nd	Plain White Oak
2 "	4/4	No. 1 Com.	"
2 "	10/4	No. 1 Com. and Better	Birch
1 "	12/4	"	"
1 "	10/4	"	Basswood
5 "	6/4	No. 2 Com. and Better	Gray Elm
5 "	4/4 to 8/4	No. 1 Com. and Better End Dried	White Maple

Send us your enquiries for anything needed in Northern and Southern Hardwoods.

DIMENSION

My Specialty is

Dimension Lumber

For Manufacturers of

Wagons and Implements, Buggies and Autos, Furniture, Railroad Car and Track Material

Standard Sizes on Hand for Prompt Shipment. Special Sizes Cut to Order

SOUTHERN HARDWOOD LUMBER

C. B. COLBORN

Office, Dimension Mill & Yard
Belt Line at McLean.

MEMPHIS - TENN.

A name that should be on your inquiry list for Hardwood Lumber

American Column & Lumber Co.

Brunson Building, COLUMBUS, OHIO

—Manufacturers of—

West Virginia

Soft Yellow Poplar
Plain White Oak
Plain Red Oak
Quartered White Oak
White Oak Timbers and Plank

Chestnut	Butternut
Basswood	Ash
Maple	Cherry
Hickory	Walnut
Beech	Sycamore
Buckeye	Black Gum
Birch	Hemlock

Oak and Hardwood Dimension Stock

Steele & Hibbard Lumber Co.

ST. LOUIS, MO.

56 Years in Business

We carry a large stock of dry

Hardwood Lumber

25 Different Kinds
Quick Shipment
Write or wire for Prices

We specialize Oak cut from Mild Texture Missouri Timber with thin sap both plain and quarter sawed.

We ship also from Sawmills direct; Red as well as Sap Gum and Poplar both plain and quarter sawed, Sound Wormy Chestnut, Cypress and Ash.

"Wire collect for prices or other information. Time is Money, delays pay no dividend."

St. Francis Basin Hardwoods

Kraetzer Cured and Air Dried

Tennessee Aromatic Red Cedar

Carloads and less or mixed with Hardwoods

"What Others Say"

"Your letter of February 15th received and we want to say that this was a very nice lot of lumber. It was good widths and lengths and well manufactured, dry stock and the grading was very liberal. We are sorry we cannot use more of this lumber at the present time. *We received several cars from other manufacturers at a cheaper price but the lumber was not nearly as satisfactory.* When we are in need of more stock we will take the matter up with you."

(Note—The above was sent us February 24, 1921 unsolicited. Name given on application).

GEO. C. BROWN & COMPANY

Home Office - MEMPHIS, TENN.

BAND MILLS, PROCTOR, ARK. CROOKED BAYOU, ARK.

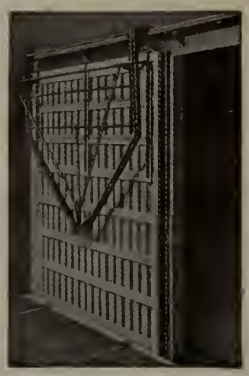
BLACK BROS.
CLAMPS

Where Black Bros. Clamps are known, there is no second choice. Know them.

Sold by Aikenhead Hardware Ltd., Toronto Vokes Hardware Co., Ltd. Toronto J. L. Neilson & Co., Winnipeg and other leading dealers throughout Canada.

The Black Bros. Co. - Mendota, Ill., U.S.A.

The Door Carrier System



Makes your dry-kiln doors steam-tight and saves time, heat, trouble and money.

Carrier lifts door clear of kiln and carries it down track. Returning, deposits door to rabbeted joint, where it is held steam-tight by its own weight. Applicable to old or new kilns.

Ask for catalogue.

DRY KILN DOOR CARRIER CO.
1117 Cornell Ave.
INDIANAPOLIS, IND.

Yellow Poplar Lumber Co.

Manufacturers of Band Sawed

Poplar Plain Oak
Quartered Oak
Chestnut Basswood

Capacity 50,000,000 per annum

SPECIALTY: Monogram Brand Oak Flooring

CANADIAN ENQUIRIES SOLICITED

COAL GROVE, OHIO, U. S. A.

Tennessee Lumber & Coal Company

Manufacturers and Wholesalers

APPALACHIAN HARDWOODS

Soft Textured White and Red Oak, Poplar, Chestnut, Southern Gum

OAK TIMBERS AND PLANKING CUT TO ORDER

Band Mills: Verdun, Tenn., Louvain, Tenn. Submit your enquiries to our Sales office, Cincinnati, Ohio.

"Hartzell's Choice Walnut"

The way Walnut comes to us

COMING AND GOING

One constant stream of American Black Walnut from "Stump to Consumer" flowing through a steady, reliable and satisfactory channel.

"Geo. W. Hartzell"

Logs in the rough coming in Veneers and Lumber of the highest quality going out daily year in and year out covering a period of 35 years.

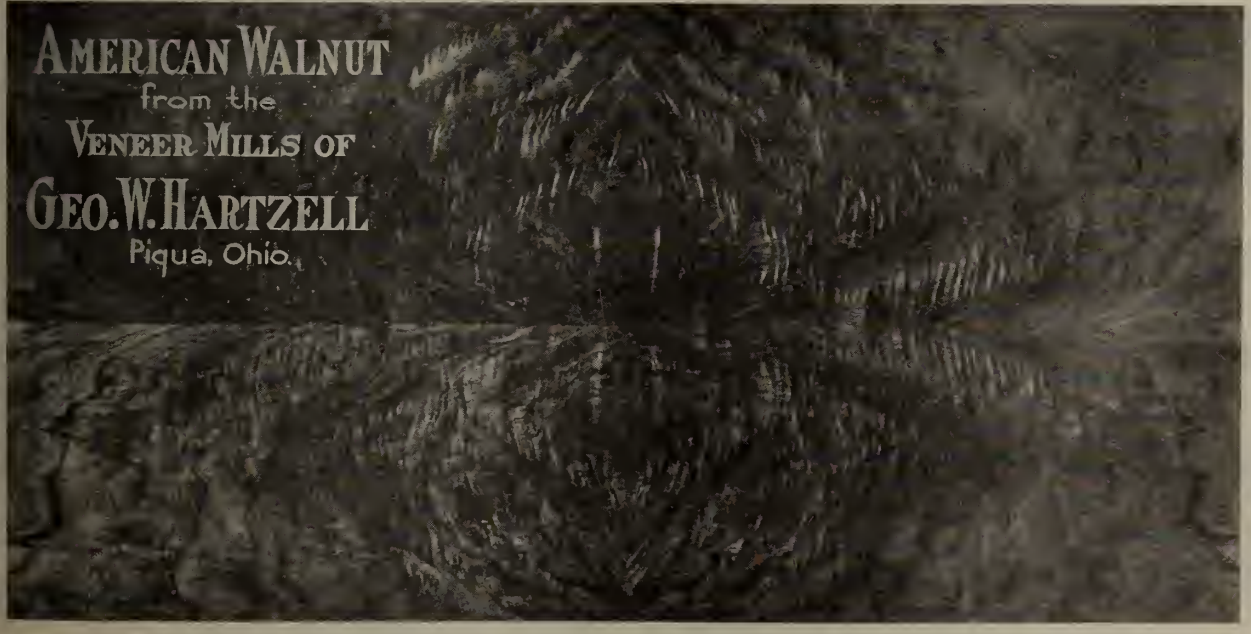
We rightfully claim your patronage because of "SERVICE and QUALITY," if there is any question in your mind about it

"Try Us and We Will Ship You the Convincer"

No Order too large, no Order too small to receive the close and careful attention it is our custom to give. That is a great part of our business, serving our customers.

"WRITE FOR SAMPLES AND QUOTATIONS"

Geo. W. Hartzell - Piqua, Ohio



The way it goes to our Customers

Highest Quality

St. Francis Basin Hardwoods

Band Sawmill - Marmaduke, Ark.

SAH
OAK
GUM
CYPRESS
TUPELO
SOFT MAPLE

The Vail Cooperage Co.

General Office - FORT WAYNE, Ind.

OUR EXPORT BRAND

Service **LHC** *Quality*

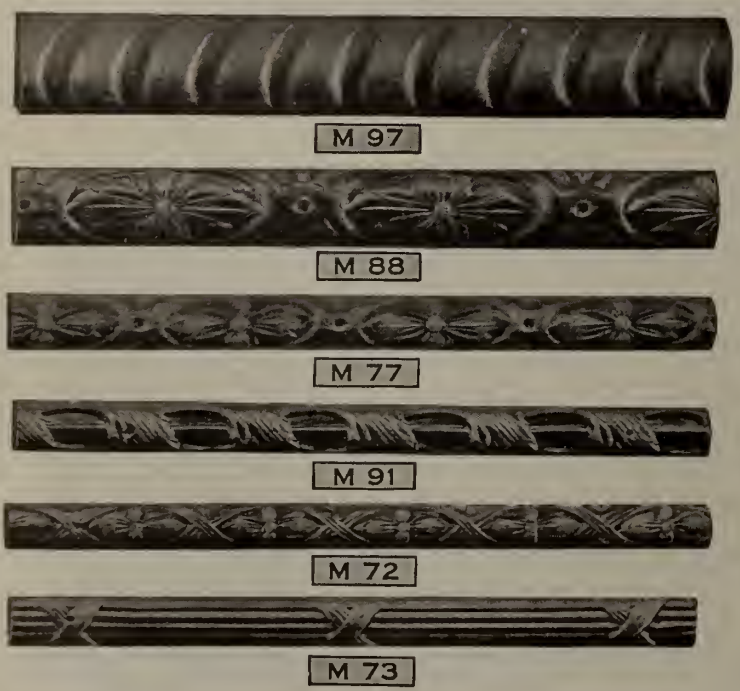
Prompt
SPECIAL
Plain White Oak
50 M' 1" FAS
30 M' 1¼" FAS
12 M' 1½" FAS
15 M' 2" FAS

GUM
ASH
OAK
POPLAR
CHESTNUT

Shipments
SPECIAL
Plain White Oak
70 M' 1" No.1 C&S
20 M' 1¼" No.1 C&S
20 M' 1½" No.1 C&S
15 M' 2" No.1 C&S

LIVERPOOL HARDWOOD COMPANY Inc.

50 Church St. NEW YORK CITY
Bank of Commerce Bldg. MEMPHIS, TENN.



MOULDINGS We are making more Period Mouldings than ever before. Orders should be placed early to assure your supply when needed.

KNOBS The Period Knobs we placed on the market a few months ago are proving very popular. If you have not received samples ask for them now.

ROSETTES A new Period item to accompany the knobs.

Waddell Manufacturing Company

Coldbrook and Taylor, N. W. Grand Rapids, Mich.

Announcement :—

Special Offerings

in

Mahogany and Walnut Veneer

Word from you will bring samples and prices

Mahogany Lumber* - *Every grade and thickness on sticks in our yards

Lewis Thompson & Co. Inc.

Colonial Trust Bldg. **Philadelphia, Pa.**

CHAPMAN and DEWEY LUMBER CO. MOVES MAIN OFFICES TO MEMPHIS

EFFECTIVE October 1, the main offices of our company will be located in the Bank of Commerce Building, Memphis, Tennessee. The change from Kansas City to Memphis was made to put our offices in closer touch with our yards and mills at Marked Tree, Arkansas, to the end that we could give our customers more efficient service. We would welcome a personal call when you are in Memphis.

Chapman & Dewey Lumber Co.

Southern Hardwoods

Main Office: Bank of Commerce Bldg. Memphis, Tenn.

District Sales Office - 500 Rialto Bldg., Kansas City, Mo.

E. Sondheimer Co. Memphis, Tenn.

Manufacturers and Exporters of the famous Tensas Basin Red Gum, and other hardwood lumber.

We list below a portion of our stock of thoroughly air-dried, band-sawn hardwoods, and solicit your inquiries by mail or wire.

PLAIN RED GUM

100M ft.....5/8 1s & 2s
50M ft.....5/8 No. 1 Com.
75M ft.....3/4 No. 1 Com.
50M ft.....4/4 1s & 2s
50M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.

QUARTERED RED GUM

25M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
35M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
35M ft.....6/4 1s & 2s
50M ft.....6/4 No. 1 Com.
60M ft.....8/4 1s & 2s
60M ft.....8/4 No. 1 Com.
40M ft.....10 & 12/4 No. 1 C&B

QUARTERED SAP GUM

25M ft.....5/4 No. 1 Com.
25M ft.....6/4 FAS
100M ft.....8/4 No. 1 C&B
19M ft.....10/4 No. 1 Com.

PLAIN SAP GUM

100M ft.....5/8 1s & 2s
100M ft.....5/8 No. 1 Com.
50M ft.....3/4 1s & 2s
50M ft.....3/4 No. 1 Com.
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
100M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.

PLAIN WHITE OAK

25M ft.....3/4 1s & 2s
50M ft.....3/4 No. 1 Com.
25M ft.....4/4 1s & 2s
25M ft.....4/4 No. 1 Com.

PLAIN RED OAK

100M ft.....3/4 1s & 2s
100M ft.....3/4 No. 1 Com.
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
25M ft.....8/4 No. 1 C&B

QUARTERED RED OAK

50M ft.....4/4 No. 1 Com.

QUARTERED WHITE OAK

50M ft.....4/4 No. 1 Com.

COTTONWOOD

100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
100M ft.....6/4 1s & 2s
25M ft.....6/4 No. 1 Com.

QUARTERED TUPELO

50M ft.....4/4 No. 1 C&B

PLAIN TUPELO

50M ft.....5/8 No. 1 C&B
50M ft.....3/4 No. 1 C&B
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
50M ft.....6/4 1s & 2s
50M ft.....6/4 No. 1 Com.

WILLOW

100M ft.....4/4 1s & 2s
200M ft.....4/4 No. 1 Com.
100M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.
75M ft.....6/4 1s & 2s
15M ft.....6/4 No. 1 Com.
15M ft.....8/4 1s & 2s
50M ft.....8/4 No. 1 Com.

Band-mills at Baton Rouge, La., Tallulah, La., and Sondheimer, La.
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Bigelow HARDWOOD PRODUCTS

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Canadian Hardwoods

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We have the facilities for giving Canadian Woodworkers and Furniture Manufacturers a prompt service on straight or mixed cars of the following:

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Soft textured Plain and finely figured Quarter-Sawn Red and White Oak our specialty.

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OWENSBORO - KENTUCKY
Bandmills: Owensboro; Campbellsville, Kentucky

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(Not Better than the Best but as Good as the Best)

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We list below, items of our own manufacture, band sawn, that we are in a position to ship promptly.

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4/4, 5/4, 6/4, & 8/4 Sound Wormy Oak

5/8, 4/4, 5/4 & 6/4 Plain Sap Gum

4, 5, 6, 8, 10 & 12/4 Qtd. Sap Gum

4, 5 & 6/4 Plain Red Gum.

4, 5, 6, 8, 10 & 12/4 Qtd. Red Gum

4, 5, 6 & 8/4 Tupelo Gum.

5/8, 4, 5, 10 & 12/4 Ash.

5/8, 4, 5, 6, 8, 10 & 12/4 Elm.

5/8, 10 & 12/4 Maple.

4, 5 & 6/4 Cottonwood.

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MEMPHIS, TENNESSEE

OTIS
TRADE MARK

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ESTABLISHED 1867
INCORPORATED 1886

Laguna
Mexican

MAHOGANY

Rarely are such stores of precious wood to be found as may be seen in our yards. Across the seas from tropic lands it comes. From thick jungles where the light of day but dimly penetrates and where tangled native paths make difficult the bringing out of timber. Here the black man labors, risking life from jungle dangers, that supplies will not diminish and your orders may be filled.

Twelve million feet per year is the capacity of OTIS mills. An adequate supply is always on hand for prompt shipment. Get our prices.

Otis Manufacturing Company

Peters Avenue and The River

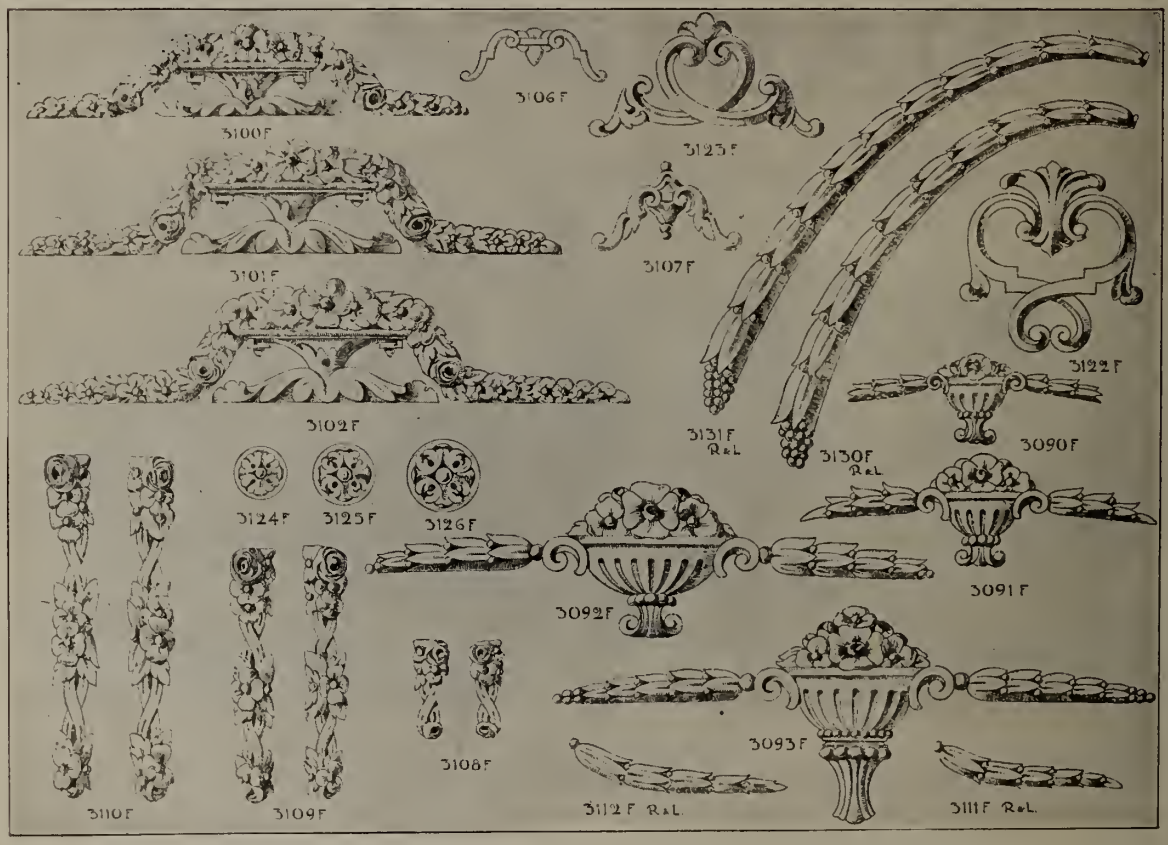
NEW ORLEANS, L.A.

Chicago Office: Room 208, 128 N. Wells Street

PERIOD CARVINGS

for

FURNITURE



Largest Manufacturers of Imitation Wood Carvings in the World

Quality the Best — Prompt Shipment

Unlimited facilities for the manufacturing of high grade period wood carvings in composition and wood fibre. Reproductions of exclusive designs our specialty.

CATALOGUE SENT ON REQUEST

THE DECORATORS SUPPLY COMPANY

ARCHER, LEO AND LIME STREETS

CHICAGO

THE BEST IS NONE TOO GOOD

WE manufacture but one grade of lumber—the best. Because it has been our experience that most woodworkers demand only the highest grade. They believe the best is none too good. And when you consider the prices we are able to quote, it isn't worth while accepting a lower grade, anyway.

Why not get in touch with us?

OAK - POPLAR - GUM

Memphis Band Mill Company

QUALITY

"Makers of high grade lumber"

Memphis - Tennessee

SERVICE

Efficiency Marks Every Step of Our Service to You

Exact photograph of alley in our yard

White and Red Oak

Plain & Quarter Sawed Red Gum

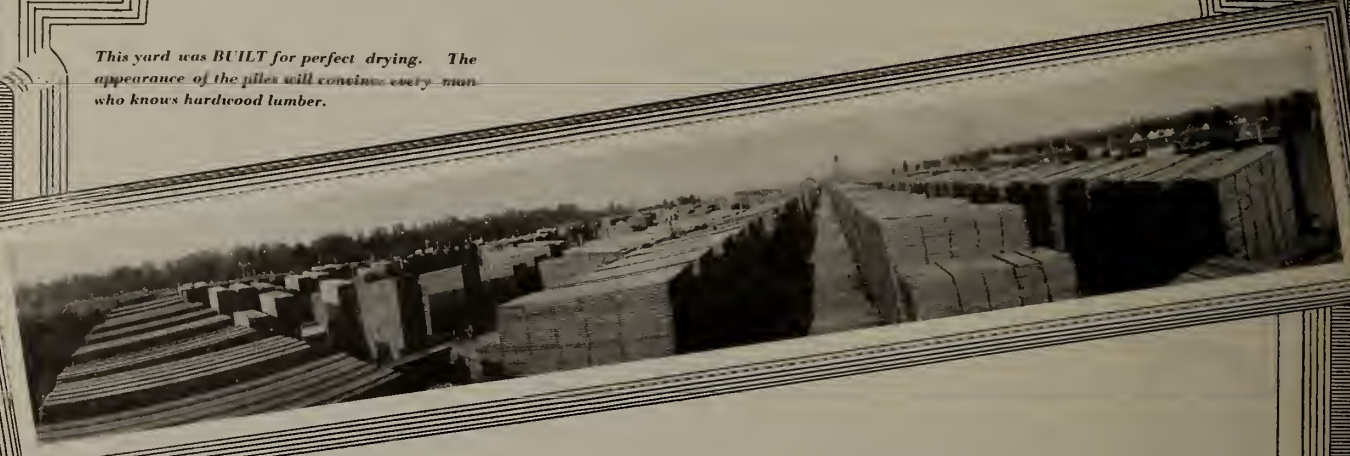
Our Specialty Quarter Sawed Red Gum in Plain and Figured Wood

From the cutting to the delivery to your hands, our entire stock receives the most careful attention. All the excellence of quality and the beauty of the wood is kept just as it is when cut. When next you are in need of Oak, Ash, Elm, and Cypress of first class quality and in perfect condition write us. We can ship promptly.

BARR-HOLADAY LUMBER CO.

BAND MILL AT LOUISE, MISS. GREENFIELD, OHIO

WIS



This yard was BUILT for perfect drying. The appearance of the piles will convince every man who knows hardwood lumber.

Lumber Can't Be ALWAYS Good Without Perfect Piling

The *correct* drying of hardwood lumber is a science based on definite formulae. Recognizing this, our yard was ***built*** to insure the most perfect possible drying.

Everyone familiar with lumber will recognize what the appearance of the piles in the accompanying photograph means. They are your guarantee of flat, straight, clean lumber.

Our list includes the standard species and grades of southern hardwoods with NOTHING PICKED OUT, and has behind it a comprehensive and conscientious desire to give the customer his full measure of value and service,

Wisconsin Lumber Company

Chicago, Illinois

BAND MILLS, DEERING, MO.

On October 17, 1906 the S. S. "Corinth" sailed from Axim, Gold Coast, Africa, to Pensacola, Florida, with the first full cargo of mahogany logs ever shipped from the continent of Africa.

Prior to 1860 complete cargos had sailed from Africa, but the holds were laden with human freights from which was manufactured the great American Civil war.

From the valuable cargo aboard the "Corinth" was produced the beautiful and the useful—a contribution to the prosperity and civilization of America.

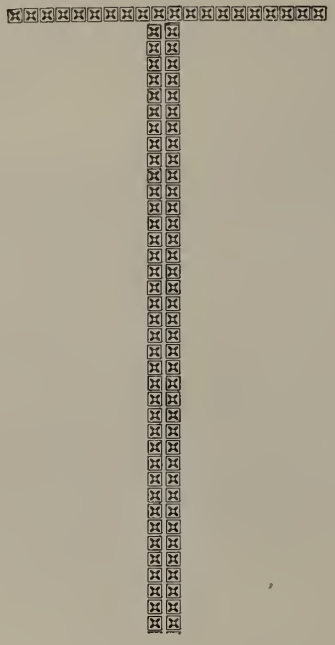
To the successful venture of this pioneer ship is largely due the position and influence of African Mahogany in the wood artistry of today.

It is immaterial that the Mengel Company were the operators of this ship and the owners of this cargo.

THE MENGEL COMPANY
INCORPORATED
LOUISVILLE, KY.

THE PAST AND PRESENT IN MAHOGANY

Fibro-Kane Patented OPEN WEBBING



"THE perfect substitute for genuine open cane webbing." Takes a stained or enameled finish much better than genuine cane and retains it. It does not dry out and crack or break around the edges. A piece inserted in a chair or other article of furniture and subjected to the hardest possible wear in your factory or home will prove it to you.

Fibro Manufacturing Co.

Drexel Building

Philadelphia - Pennsylvania

ESTABLISHED 1892 INCORPORATED 1916

ROBT. BURY & CO., Canada

LIMITED

1 Spadina Avenue, Toronto

Our Dry Kilns have a capacity for drying 200,000 feet per month. We will dry your transit cars.

All Canadian and American Hardwoods
Mahogany, Walnut, Veneers and Panels of every description

Kiln dried stock carried in all woods

VENEERS—Mahogany, Walnut, Oak, Birch, Basswood, Ash, Maple, Elm and Gum
Log run or cut to dimension

PANELS—Birch, Basswood, Ash, Maple, Elm, Mahogany, Walnut and Oak

We Specialize in Mixed Shipments of Dry Hardwoods, Veneers and Panels

This is a good time to conserve your capital by making purchases in this manner

Head Office and Veneer Warehouse
1 Spadina Avenue, TORONTO

Lumber Yard, Dry Kilns and Mill
Foot Spadina Ave., TORONTO

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CANADIAN
WOODWORKER
and
Furniture Manufacturer

A Monthly Publication of Trade News and Practical Information, reaching the factories producing Interior Finish, Doors, Sash, Flooring, Boxes, Aeroplanes, Furniture, Pianos, etc.

Woodworker Publishing Company, Limited
345 Adelaide Street West - - - - - - TORONTO
Branches:
Montreal, Winnipeg, Vancouver, New York, Chicago.
Subscription, $2.00 a year; foreign, $2.50.

Authorized by the Postmaster General for Canada, for transmission as second class matter.

Vol. 21 Toronto, October, 1921 No. 10

Will There Be Lumber Shortage?

Recent issues of the "Canadian Woodworker and Furniture Manufacturer" have contained pointed reference to the lumber market. Lumber users have been almost urged to buy while prices were favorable, and a good assortment of stock available. The suggestion was made and repeated that the opportune time in which to purchase lumber could not last indefinitely, that it was rapidly drawing to an end.

From information and reports at hand, it would appear as if this period has definitely passed, and that we are facing a period of strengthened demand and higher values. During the past few weeks prices on many items, chiefly the better grades, have advanced from $5.00 to $10.00 per M, while at the same time upper grade stock is rapidly disappearing from the market, and as a result is becoming increasingly difficult to secure.

Many manufacturers have not heeded our warnings. No doubt they felt that as the demand for their product was none too strong, it was not advisable to load up with raw material under such conditions, or, perhaps, they believed that lumber prices would recede still further before they stabilized or stiffened. We believe that we are acting in the best interests of those who have permitted their supply of lumber to run low when we attempt to drive home the seriousness of the present situation.

The mere fact that lumber values have moved up a few dollars is neither here nor there, for such an advance can be readily taken care of by adjusting the selling price of the finished product or could, perhaps, be absorbed without curtailing profits to any great extent. The danger lies in the fact that the better grades of hardwood are scarce, are rapidly disappearing from the market, and the strong possibility that the next few months will witness an acute shortage, if not an absolute famine of hardwoods in all grades above No. 2 common. The belief is general that there is a strong pent-up demand, and when once the gravity of the present situation is fully realized, there will be a rush to cover and all desirable material will be rapidly taken up.

If you do not agree with our outline of conditions in this field, a few inquiries among lumber manufacturers should either confirm or disprove our contention. If your stock of lumber is getting low, you owe it to yourself to, at least, investigate the market and see how easy or how difficult it is going to be to secure the material needed to tide you over the next six months or year. It is anything but pleasant to find that the lumber needed to supply the increasing volume of business which is offering cannot be secured, regardless of price.

Fire Loss in Canada Still High

Sir Henry Drayton, Minister of Finance, in addressing the Dominion Fire Prevention Association at Ottawa recently, touched on Canada's fire losses, which, he said, were ten times as heavy per capita as those of Great Britain. The result of this is that high premiums are being charged, so that insurance costs five times as much in Canada as in the Mother Country. These premiums can be reduced in the exact ratio that we are successful in reducing this enormous loss.

The figures for 1920 show a total loss of about $30,000,000, or a little in excess of $300 per capita. Many do not realize the seriousness of this high toll which is taken annually of our resources. The opinion is general that because certain of these fire losses are fully covered by insurance that no loss had been incurred. This is an utter fallacy. Everything destroyed by fire is lost. Our national assets have been reduced by the amount of that loss, and whether or not the insurance companies reimburse the loser, does not alter this fact in the slightest degree. In any event we provide the money with which the insurance companies liquidate all losses.

In this connection the woodworker must shoulder a large share of the responsibility. His is a hazardous occupation. Every issue of the "Canadian Woodworker and Furniture Manufacturer" contains reference to fires which have occurred in woodworking establishments. During a year the loss in this one industry alone reaches a startling figure. A considerable proportion of this loss is due to carelessness and to the fact that preventative measures have not been put into effect. While such equipment as automatic sprinkler systems, fire engines and extinguishers offer an admirable protection against fire, those who do not wish to incur such expense can solve the problem, partially at least, by keeping their plant scrupulously clean and by seeing that all stock stored in their factory is kept in an orderly manner and by taking other simple precautionary measures which will suggest themselves.

Injustice of Guesswork in Piece Rates

Why Piece-work is Not Popular — Responsibility Does Not Rest with Employer Alone—Reliable Basis for Computation Available—Should Help Rectify Industrial Situation

By WM. SNAITH, Associate Engineer
Forest Products Engineering Company, Chicago.

The old lady who said that all she knew about the doctrine of total depravity was that it was a good doctrine, would feel quite at home in our midst to-day. Poor old human nature may not be totally depraved, but it does some things that show it has got a long way to go to attain unto perfection. The perversity with which modern civilization turns the best things discovered for it by science, into methods for blotting out considerable portions of the human race has been indelibly impressed on the present generation of the sons of men. It is largely fortunate that we did not know much more than we did of high explosives, or airplanes, or gases. There would be fewer still of us left to attend to the world's work.

The way in which the principle of piece-work has been handled in the modern industrial system is another example of the same kind of perversity. For the sake, as much of the employee as of the employer, it is almost a tragedy that the fairest way of paying for labor should be as discredited as is this. There is no mystery surrounding the cause of this discredit and its existence is universal. Piece-work has been wrecked on the rock bearing the motto, "Peace rates were made to be cut." The salvaging of the ship will be a long and tedious process. It will be accomplished by men who do not believe that promises were made to be broken, by men who know that honesty IS the best policy. They will have to work against heavy odds, there will be many slips and much hard work, but they will ultimately succeed, because what they are working for is fundamentally right.

Employer and Emplyee Equally Responsible

The responsibility for piece rates being cut does not rest alone with the man who does the cutting. This is perhaps not obvious. I get a job and undertake to work for you. The contract implied between us is that I shall deliver to you as good a day's work as I am capable of and you, in return, are to pay me so many cents an hour. After a while you offer me a new contract under which I can make more money, if I will turn out a stated quantity of work in a certain time. In other words, I go on piece-work. Now you based your offer (piece-work price) on what I delivered to you as my idea of a fair day's work. When I found I could make more money by digging in a little harder I dug and made quite a good thing for a while. Then, you cut the rate. I thought it hardly fair, but I could still make money at the new rate, so I kept at it, found I could do better still, did it—and you cut again. This time I didn't go after the rate and try to beat it. I figured that as long as I didn't earn over so much a day you would be satisfied, so between us we succeeded in curtailing further increases in production. We both lost out on the deal, and the financial loss was less than the intangible loss in good-will. I had thought you were "square," and when you undertook to pay me so many cents a piece I thought you'd do so. When you cut the price it seemed to me as bad as breaking any other kind of a contract. It never occurred to me that I started it when I delivered a smaller day's work than I proved afterwards I was easily able to do. You no doubt felt that if you hadn't put me on piece-work I would have done you out of considerable money. Well, we won't get anywhere by calling each other names. We were neither of us fair because we both guessed. I guessed at a fair day's work and you guessed at a fair piece rate. Both of us guessed wrong and both of us got in wrong fixing up our mistakes.

Must Not be Set Haphazardly

So much for the responsible for the discredit which has nearly made a complete wreck of the principle of piece-work. The fundamental cause of the trouble is that the rates were guessed at. The closer the guess happened to be the less trouble was caused, and some guesses are bound to be right. But guesswork is a poor foundation for anything. Of course, we wouldn't be getting anywhere with all this discussion if there were not other material for foundation purposes. Piece rates are now set after a careful analysis of time studies and the amount of effort or skill is gauged accurately. The man of unusual skill or ability is paid more than the less ambitious worker and rates are not cut.

Piece-work is not only the fairest way to pay for labor, but this principle is tacitly conceded by the universal attitude of doubt which the departure from it arouses. The doctor's charge of so much per visit is piece-work and easy to justify or understand. The charge for an operation, based on the size of the patient's bank roll, is held up to ridicule as a joke. It is not easy to see the justification for it or for an unitemized lawyer's bill.

Most of the things we buy are measured out to us: so much for so much money. Coal is so many dollars a ton; sugar costs a definite number of cents per pound; milk is sold by the gallon and eggs by the dozen. A dealer who would suggest that for a dollar he would deliver an unstated amount of sugar would get no trade. Yet unstated amounts of labor are all that are bought for dollars under the day work plan. The result is confusion in arriving at present and future costs. Most manufacturers have to make their product within certain very definite limits of cost. Cost of material is readily ascertained, but what will be paid for labor is not so easily known when piece-work is not the rule.

We are coming to a realization of many fundamental truths nowadays. If manufacturers can get orders, there is employment. The one who can do the work cheaper than the rest gets the most orders. The nation which can produce the most goods, over and above its own needs, can exchange them for the greatest amount of goods from other nations, raising its standard of living. Many things contribute to our prosperity and piece-work is undoubtedly one of them. It is supremely important that piece rates be just and justice can only be secured if guesswork is allowed no place in the calculation of any piece rates.

Better Furnished Homes Campaign

Furniture Manufacturers of Canada Launch New Publicity Campaign.

Seal of Home Furnishings Bureau to be Featured in all Advertising

By R. W. WELLS

Another general advertising campaign is to be launched shortly by a number of the furniture manufacturers of Canada working through the Home Furnishings Bureau. The plans for this publicity effort are about complete, and it is anticipated that the opening advertisements will appear durng the next week or two.

In many ways the present is a particularly opportune time for a sales-compelling campaign of this kind. Business is showing signs of an awakening, the demand for furniture is slowly but surely increasing; advertisng is always more effctive on a quickening market, as instead of having to overcome a certain amount of indifference and inertia on the part of the buying public, the full weight of all publicity work goes toward stimulating and increasing sales. Not only that, but coming at this time, it should have a beneficial effect on the Christmas demand for furniture.

This campiagn will be along similar lines to the one conducted last fall, only on a more moderate scale. Twenty newspapers, selected for their standing and the extent of the fields covered, will be used, and each paper will run thirteen different advertisements, at the rate of two a week. Through these twenty mediums it is hoped to reach the majority of those in Canada who are interested in furniture and home furnishings.

Bureau Trade-mark to be Featured

A feature of the campaign will be the use of the seal or trade mark of the Home Furnishing Bureau, which is to appear in all the advertising. The trade mark will thus be linked up with the idea of better furniture, and the result should be that many buyers will show a preference for pieces which carry this seal, for to them it will be an assurance that the furniture in question is the product of a reputable house and is well made in every respect.

This trade mark, which is shown in the accompanying illustration, has been registered at Ottawa with each member of the bureau as a registered assignee. Thus all members have the right, which they are strongly urged to exercise, to use this seal in all their advertising, whether general or direct by mail, and also to have it appear on all stationery, billheads, etc. It is hoped that those behind this campaign will use this seal to such an extent that in the minds of both dealer and the buying public, it will become synonymous with good, dependable furniture, well made and well finished. The use of this trade mark will also indicate to the dealer that the manufacturer using it is heart and soul behind the Home Furnishing Bureau in all its activities. It will in a way show the dealer who his friends are.

The plan which has been prepared for this campaign is a little more direct than the one followed last year. While no mention is to be made of any particular line or any particular style of furniture, twenty-six advertisements have been prepared, each illustrated by a room scene in which the furniture shown has been taken from the line of one of the supporting manufacturers. Thus the series of advertisements to be run will give publicity to furniture produced by each of the twenty-six members of the bureau.

Campaign Made More Direct

In an endeavor to make this publicity more effective from the point of view of direct sales, the furniture retailers are to be supplied with a portfolio containing proofs of the twenty-six advertisements which go to make up the series, and at the same time informing them whose furniture is used to illustrate each piece of copy. Each member of the bureau will be furnished with a programme, giving a list of papers,, and the dates on which his particular advertisement is to appear. Thus he will be in a position to use this advance information and suggest to the dealers in a certain district that the advertisement of the Home Furnishings Bureau, which will appear in their local paper on a certain date, is featuring such and such a suite. The suggestion can also be made that the furniture retailer make a special drive on this particular suite for the week in question, featuring it in his window and perhaps doing a little special advertising on his own account. In this way each member stands to gain some direct benefit from the advertising as well as share in the increased demand for furniture which will assuredly result from publicity work of this kind.

Publicty Work Should be Continuous

It is to be hoped that after having profited by the mistakes of the past, the furniture manufacturers of Canada will back the Home Furnishing Bureau persistently and consistently. General publicity of this nature must be planned well in advance and carried out as part of an extended campaign. Public opinion and public tastes cannot be influenced and moulded in a day or in a month. It is a case where it is necessary to keep everlastingly at it. Last fall the campaign was carried to a point where it was beginning to show results, and then dropped. This was a mistake. It is more than probable that if last year's effort had been continued on through 1921, instead of having fallen through, the total volume of furniture sales for the present year would be hundreds of thousands of dollars, if not a million of two, ahead of what it will be.

A word of warning is, perhaps not out of place. In their desire to have this advertising made more direct, the members of the bureau must not lose sight of the fact that a campaign of this kind must necessarily

be general in its scope. To be most effective it must be so planned and conducted as to sell ideas rather than individual pieces or suites of furniture. The demand for furniture can be increased and the Better Furnished Homes Campaign carried out successfully by emphasizing the comfort and pleasure to be derived from a well-furnished home, by touching on the desirability of fine furniture, the pride of possession, by emphasizing the fact that furniture at present prices is a good investment, that good furniture is a necessity, not a luxury, by touching on the influence of well-furnished homes, not only on the home life, but on the life of the nation, and, lastly, by instructing the public as to how they can improve the furnishings of their home and show good taste in theselection and placing of the furniture and furnishings.

The following is a list of the furniture manufacturers who are supporting thee oming publicity campaign: Canada Furniture Mfrs., Woodstock; Stratford Chair Co., Stratford; McLagan Furniture Co., Stratford; Snyder Bros. Upholstering Co., Waterloo; Knechtel Furniture Co., Hanover; North American Furniture Co., Owen Sound; J. C. Mundell & Co., Elora; Strathroy Furniture Co., Strathroy; Meaford Mfg. Co., Meaford; Baetz Bros. Furnitnre Co., Kitchener; Jacques Furniture Co., Kitchener; Gibbard Furniture Co., Napanee; Andrew Malcolm Furniture Co., Kincardine; Malcolm & Hill, Kitchener; Schierholtz Furniture Co., New Hamburg; Owen Sound Chair Co., Owen Sound; Beaver Furniture Co., Kitchener; F. E. Coombe Furniture Co., Kincardine; North American Bent Chair Co., Owen Sonnd; Kindel Bed Co., Stratford; Baetz Bros. Specialty Co., Kitchener; J. B. Watson Furniture Co., Kincardine; Andrew Gray Co., Owen Cound; Anthes Baetz Furniture Co., Kitchener; H. Krug Furniture Co., Kitchener; Malcolm & Souter Co., Ltd., Hespeler.

The Top Sergeant in Woodworking Industry

Key Positions Held by Foremen—Logical Man to Handle Production and Efficiency Problems—Can be Trained to Render Greater Service

By RALPH S. FOSS
Vice-president, Business Training Corporation, New York.

Much is being written these days as to the waste in the woodworking industry—waste of material, waste of time, of effort, of energy, and of power. In common with other industries, it holds out a constant invitation to business doctors to help it over its periods of stress and strain. Remedies are being suggested that may prolong the life of the patient, but in few cases will they effect a permanent cure. A powerful drug may get the patient on his feet again temporarily, but, if there is something organically wrong with him, a cure will have to be wisely administered and patiently endured.

The woodworking industry has gone through many fluctuations within the past ten years. First came the campaign to modernize equipment, then to modernize shop methods, then to stimulate production and to harmonize industrial relations, and so forth. When labor was scarce and demand was heavy, "production at all costs" was the watchword. Manufacturers were driven to radical expedients to placate labor, and many were tempted to grasp at Utopian schemes proposed by social dreamers in order to keep peace in the family. Now that conditions are reversed and labor is begging at the gate for employment, another set of grim-faced specialists are knocking at the door to advise the manufacturer on reducing wages, fighting unions, eliminating waste, and turning his shop into a cold-blooded piece of mechanism.

Where Responsibility Lies

While many manufacturers have yielded to the hysteria produced by these extreme conditions, trying to take advantage of temporary ups and downs through the use of patient nostrums, others have been calmly getting their houses in order on a permanent basis by putting all of these problems of production squarely up to the logical man—the foreman on the job. After all, what problem is there in manufacturing—be it industrial relations, safety, lowered costs, better quality, wage adjustments, increased production, or anything else—which will not ultimately yield to the pressure of intelligent, broad-gauged, energized foremanship?

The right kind of a foreman is usually able to keep his team functioning harmoniously; he smooths out misunderstandings among the men, and stimulates them to better effort. If a wage reduction is necessary, he can "sell" his men on the idea, because he has their confidence. If an improved system of costs is introduced, if better methods of routing and dispatching are worked out, the foreman is the man who makes these plans succeed or fail. If he has a clear understanding of the principles on which efficient production must rest, he can then co-operate intelligently with the planning and engineering departments.

Importance of Position Not Realized

Few will gainsay that the key to most improvements in the shop is the foreman, and that if a plant has nothing but able foremen and assistants there would be fewer labor troubles and more economical production. The real difficulty is that the average foreman does not measure up to these requirements. And this is not entirely his fault. The mere act of loading responsibilities on a man does not necessarily qualify him to discharge them effectively. In the normal woodworking plant, for example, a workman perfects his craftsmanship over a period of years, gets a reputation for being conscientious, reliable and efficient, and then one day the superintendent calls him to the office and says, "Bill, I have decided to make you foreman of your department." The next day Bill takes on his new duties with an amazing amount of ignorance about every one of them. He may have a genial personality which enables him to get along pleasantly with the men under him. His knowledge of the machines and processes comes in handy, but his executive ability, never having been developed, breaks down when the slightest strain is put upon it. Instead of being a workman with

nothing but his own job to think about, he is now a representative of the management and has to carry out its plans and policies. These duties are so different from the ones he formerly had that several years are usually taken to get adjusted to them, and in many cases the adjustment never takes place. As for constructive work, he usually has such a hard time catching up with the many requirements of his job that he never develops the baility to put new ideas into it.

How Foreman May be Developed

It is only recently that this state of affairs has been clearly realized by manufacturers and steps taken to correct it. Since it has been found that investments in improved equipment and industrial engineering can only be made profitable by having enlightened foremen, plant managers have been addressing themselves to the fundamental problem of training their key men in the principle of management in an endeavor to make real executives out of them. If we grant that enforced improvements in plant management can be secured chiefly through improved foremanship, then the only question is: what kind of foremen development will yield the quickest and most lasting results? There are three alternatives open to any plant:

1. Improvise a course of its own, which consists mainly of get-together meetings to discuss plant problems.
2. Utilize a standard correspondence course for the group, with one of the executives to lead the meetings.
3. Call upon an experienced organigation specializing in foremen development to take the full responsibility of conducting the program.

Of these three alternatives, the thoughtful manager who wants the thing done right will hesitate to adopt either of the first two. Experimental efforts by men inexperienced in foremen training have not usually been successful. Correspondence courses without skilled supervision have been equally unsatisfactory. Such experiments, it is true, have helped create esprit de corps, but they naturally do not get very far in educating the men. There has been a growing conviction that the training effort should be well-organized and systematic, requiring a definite line of study for the individual in addition to an opportunity for group discussion.

A movement of this kind which has been uniformly successful is that developed by a New York organization, specializing in this field. By means of especially prepared text material, problem work, and lectures, the foremen are given a three months' intensive group training on the subjects of teamwork, handling men, organization, costs, control, and management. The reading of the text material provides instruction in basic principles and the men apply these principles to concrete factory situations that are presented to them in the form of problems. Their solutions are forwarded to a central staff for comment and criticism, and are discussed at the group meetings which occur bi-weekly. The instruction is simple and stimulating, and is tied up closely to the questions that confront the average foreman in discharging his daily duties.

Permeating existing industrial organizations with the spirit of understanding and teamwork is only possible, however, through mass instruction and the common content of what is read and taught through that means goes a long way. It is not essential, nor is it possible, to make it go the same distance with all members of a group. When this preliminary work is thoroughly done, however, education has come into the plant to stay, and it then branches out according to the preferences and educational status of the individuals. This is often reflected in the organization of a permanent foremen's club wholly on the initiative of the men themselves. Such training is organized and conducted so as to start the mass of executive ability in any one plant thinking to some purpose, and to energize the plant as a unit. By getting all the key men in the plant together, including some of the white-collar men in the office, and giving them an intensive study in modern production methods as applied to their own manufacturing problems, more teamwork and more economical operation inevitably follows. In the furniture industry, which requires an unusual combination of quantity production and variety of product, and in which the elements of design, quality and workmanship are essential, the problems of supervision are unusually vital and make greater demands, perhaps, than in other industries.

The Big Lesson Wrigley Learned in Dull Times

"The result of my investigation was that I signed up in the midst of the depression of 1907 for $1,500,000 worth of advertising—our first national contract and a very large one indeed for us at that time. It was, as you see, another restraint in the face of an opportunity for immediate profit.

"But for once the policy did not involve the sacrifice of immediate profits even. We really had expected it would. We were after the vivid impression we thought we could make on dealers and consumers at a time when so few people were trying to sell them, and we were willing to pay something for that. We were willing to wait for our returns. But we did not have to wait. They came generously enough even the first month to meet what had seemed an enormous first payment on the advertising, due at the end of the month, and the payments every month thereafter were entirely met out of the increase in our profits, with a continually widening margin to spare."—Wm. Wrigley, Jr., in "System."

The man at the cross-cut saw can spoil more wood in a day, if he is careless, than any other man in the mill.

The Fabricated Building Co. is the name of a partnership recently formed in Vancouver, B. C. John E. Baxter and E. C. Blackwell are two of the organizers.

The toy factory at Murrayville, B. C., conducted by Hugh A. Gosling, was recently destroyed by fire. Mr. Gosling plans on rebuilding on a new site he has secured at Milner, B. C.

Two Sample Costs

Ordered Jan 27-1921 Start Jan 8-21 Due
Delivered Begun Done Feb 10/21 Dept. Order No. 2705

NAME Smith
JOB
CLASS Bench

RECAP. OF COST		
Selling Price		
Cost	51	60
Profit or Loss		
%		
Labor O.D.M.	23	35
Lumber	19	65
	43	00
20 % Overhead	8	60
Total	51	60

Order in Detail

1 Counter 7'-3½" x 1'-6" x 3'-4"
to detail in B.C. fir

#1

Quantity	Lumber Used per Cutting Order	Price		
62	ft B.M. B.C fir	120	7	45
26	" " 1" Com Basswood	80	2	10
27	" " pine dressing	100	2	70
12	" " 3ply cottonwood	15	1	80
	Total Lumber Used		14	05
	Add for Waste 40 %		5	60
	Total Raw Material		19	65

Other Direct Material and Work

Add %

R63-1264-7-21

COST CARD

Factory Order No. 2705

Man No.	Dept.	DAY OF THE MONTH (Jan 27 29 31 1 2 7 9 10 / Feb)	TOTAL TIME Machine	Bench	Helper	Rate per Hr.	Amount
Coe		2 15 1 1	4 15			1 20 Mach.	14 80
Hatcher		3	3			90 Bench	8 55
Campbell		15 45 30 30 1	3				23 35
Hodsol		1		1			
Shaw		15		15			
Ivel		15		15			
Weber		30		30			
Bynell		30		30			
Buchan		30					
Spencer		1 30			30		
McBride		6 45			6 45		
			12 20		9 30		

#1

Ordered Feb 22/21 Start Feb 23/21 Due
Delivered Begun Done March 7/21 Dept. Order No. 2977

NAME Brown
JOB Sash, Frames & Doors
CLASS

RECAP. OF COST		
Selling Price		
Cost	32	20
Profit or Loss		
%		
Labor O.D.M.	12	05
Lumber	14	90
	26	95
20 % Overhead	5	25
Total	32	20

Order in Detail

1 2 Mull case frame 2x6 jamb
1⅛" x 3¾ O.S. Casing
3 case sash 1⅜" - 6 Lt. 8'x10'
1 door frame 2'-10" x 6'-10" x 1¾"
2x6 jambs, oak sill & mull
1⅛" x 3¾" O.S. casing
1 No 2. pine door, 2'-10" x 6'-10" x 1¾"
2 pan & 6 Lt solid panel

Quantity	Lumber Used per Cutting Order	Price		
31'	BM Dressing pine	100	3	10
41'	" " Common "	85	3	50
3'	" " " Oak	130		35
36'	" Run 1¾ x 5½ Jamb	10½	3	80
7'	" " 2¾ x 5¾ Mull	16	1	10
3	" " ⅝ x 7/8 Cove	1		5
	Total Lumber Used		11	90
	Add for Waste 25 %		3	00
	Total Raw Material		14	90

Other Direct Material and Work

#2

Add %

R63-1264-7-21

COST CARD

Factory Order No. 2977

Man No.	Dept.	DAY OF THE MONTH (Feb 23 24 25 26 28 7 / March)	TOTAL TIME Machine	Bench	Helper	Rate per Hr.	Amount
Churcher		20	20			Mach 1·20	5 20
Ivel		30	30			Bench 90	6 85
Churcher		1		1			12 05
Bynell		1	1				
Hatcher		1	1				
Brunside		15	15				
McBride		3 30 30		4			
Deamon		35		25			
Weber		5 5 15	25				
McCallum		30 10		40			
Hatcher		10 10	20				
White		30	30				
Craig		1 30		1 30			
			4 20	7 35			

#2

Application of cost system described, to sash and door and special order work.

A Tried and Tested Cost System

Woodworking Industry not Devoting Enough Attention to Costs—Many Operators Accept Work Below Cost—Outline of Time-proven Cost Keeping System.

By W. WARREN

I have read, with much interest, the article which appeared in the July "Canadian Woodworker" under the title of "A Study in Millwork Costs." The report, which was included in this article, has many good points. It appears to me, however, to be a compilation of estimated costs rather than concrete tests of actual work performed. The proven cost of to-day is the basis on which we estimate our work to-morrow, and unless we work out our costs accurately, they are worse than useless, and so reduce the art of estimating to "guesstimating."

There are several features in this report to which one might take exception. First—The absence of a definite size of window frame and full description. Second—The absence of actual cutting bills of each and every piece of material used in the job. Third—The small percentage of waste allowed, in this case only 15 per cent. Fourth—Machine work and assembling should be separated as factory burden differs greatly on the two trades. Fifth—50 per cent. overhead is inadequate and should not be so charged. My experience is that 50 per cent. factory burden is the correct amount to add to bench or assembling operations, and that 100 per cent. should be added to machine work. The overhead should not be confused with factory burden, but should be applied to both labor and material. Burden and overhead (or commercial burden) may differ according to local conditions, and should be worked out and proven in each individual plant.

Brief Outline of System

I append two actual costs of work done, which I think are self-explanatory. It is not possible to keep cost on a portion of the work passing through a plant, nor is it wise to endeavor to do so. A cost system will only function properly when correctly instituted and operated. Burden and overhead cannot be accurately computed on a partial system and as an estimating basis it is useless unless all classes of work are covered. This also refers to trim, sash, doors, etc., no matter whether manufactured by ourselves, purchased, stored and resold. We should keep cost on all we handle. The same principal that applies to frames and sash will also prevail on any detail work.

Our method of keeping cost is briefly as follows: All orders are entered on triplicate order forms, consecutively numbered. The original is kept by the order clerk until the work is completed, and while in his possession it is filed alphabetically so that in the event of reference, it is more readily found by name. The second copy is held and filed numerically by the shipper until the work is shipped out or delivered. The third copy is held and filed by the cost clerk. From this he opens a cost card under the name and number shown on the order, a detailed factory order is then issued to the foreman and the work gone ahead with.

Used as Basis for Estimating

From the information contained in this factory order, together with details, the layout man prepares a cutting bill, giving actual dimensions of every piece of material in the job. This cutting bill then goes to the break-out room and follows the job during its progress through the plant until it is fully complete. After the work is completed, the cutting bill goes to the cost clerk, who works up the material and enters same on the cost card. As the order passes through the factory, every workman who handles any phase of the work places his time on a tally time card. This applies to each and every order, regardless of size. At the end of each month all orders completed are tabulated on a monthly recapitulation, and so the result of each month's business is shown.

Samples of cost of various types of work are entered in an estimate book. Upon these figures we base all our

BROWN

DATE Feb. 23/21

CUTTING ORDER AND MATERIAL USED

N.B.—RETURN THIS FORM TO OFFICE WHEN JOB IS READY.

ORDER No. 2977

PLACE AT Bench dept

ARTICLE 1 case frame 1 door "

No. Pieces	Thick	Wide	Long	Grade	Material	For
2	1 3/4	3 3/4	3'-3"	stock	pine	1 3/8 jamb
1	"	"	5'-5"	"	"	" head
1	"	"	5'-10½"	"	"	" sill
3	1/4	3/4	1'-10"	"	"	
2	2 3/4	5 3/4	3'-0 7/8	Dress	"	mullion
2	1 1/8	3 3/4	3'-7"	"	"	casing
1	"	"	5'-7"	"	"	"
2	"	1 3/4	3'-4"	"	"	ou mullion
1	"	"	6'-3"	stock	"	cap

Part of cutting bill.

estimates for the current month. This, we contend, keeps our estimating department properly informed and enables them to quote with a satisfactory degree of accuracy.

Quantity of Waste Misleading

In allowing for waste, experience has taught me that the minimum that should be allowed is 25 per cent. Naturally the amount will vary according to the class of job and grade of material used, in some cases amounting as high as 50 per cent. and in exceptional instances exceeding this latter figure. Many owners and operators of woodworking plants will not admit this quantity of waste. In that, they are simply living in a fool's paradise, and some day, perhaps too late to rectify this error, they will discover that waste has drained their business dry.

No manufacturer can afford to operate a factory without a cost system. To the uninformed it looks like a big innovation. It is not so costly as one might at first anticipate. An accurate cost system can be maintained at an outlay of 1 per cent. of the business done. I know of no investment which is capable of paying such dividends as an efficient cost system.

It is not fair to our competitors to estimate and operate without an accurate knowledge of costs, neither

is it fair to our customers, for we are apt to charge one too much and another too little. It has been demonstrated time after time that those concerns who do not keep costs and who have no accurate knowledge of what their costs are, generally take work at the lowest possible figure, not infrequently at prices little more than the value of the lumber used. It is not reasonable to suppose that they would continue to accept orders which entail a loss if they knew definitely what their costs were.

There are many benefits to be derived from well-kept costs. From them we can see at a glance which departments are on a paying or losing basis. It shows us the profitable class of trade. It also indicates the employees that make money for us and those who do not. In short, a well-kept cost system will tell us almost anything we want to know concerning our business. A manufacturing operation conducted without a cost-keeping system is a speculation, but operated with one it becomes an investment. A ship cannot be navigated without compass and chart. Cost is the compass and chart of the woodworking industry.

These remarks are based on information gained from personal contact with costs as outlined above, and which I have operated during the past ten years, with improvements added from year to year.

Conditions in Furniture Industry

The officials of the Furniture Manufacturers' Association, who are touring the province, calling upon members of the industry, recently visited several Central Ontario points and met a number of furniture manufacturers on their own home grounds, so to speak. These calls are being made in the interest of the various activities of the association and also to gain a first-hand knowledge of conditions in all branches of this important industry.

Almost everywhere they went they were impressed by the spirit of optimism which was noticeable on the part of the different manufacturers on whom they had the pleasure of calling. "Business is improving," was the general response to the greeting, "How is business? It cannot be said that there is any marked improvement in demand, though it is slowly and surely gaining strength, nor has production been speeded up to any extent, but the fact that the retailers are exhibiting a tendency to buy, coupled with the fact that stocks in the hands of the dealers are well below normal, leads to the conclusion that there are better times just ahead for the furniture industry. In some cases it was found that there has been a slow but steady increase in the volume of orders coming in ever since July, while other manufacturers termed the demand spotty, but slowly gaining strength.

With regard to production, this stands to-day at about 55 per cent. of normal. There is this to be said, however, and that is that the stocks of finished furniture in the hands of the manufacturers are considerably lower than they were a few months ago.

The recent advance in lumber values, together with the higher prices which prevail on glass, point to an increase in furniture prices. It is probable that when the new lists go out early in January, many items will have been marked up rather than further reduced.

The two photos, which are shown on this page, were taken during one of the trips. The picture on the left shows J. H. Baetz, Kitchener; Wm. Cawkell, secretary of the Manufacturers' Association; Thos. Bell, of the Bell Furniture Co., Southampton, one of the pioneer furniture manufacturers, and at the age of 78 still actively engaged in producing furniture, and T. Lyle Blogg, manager of the Home Furnishings Bureau. The picture on the right shows Messrs. Baetz, Blogg and Cawkell and "Jake's" fine car.

Wins Cost Association Prize

Announcement was made to-day that the annual prize of the National Association of Cost Accountants had been awarded to Mr. R. L. Walls of the University of Chicago. This prize is awarded each year for a thesis on some practical cost subject. The competition is open to regularly enrolled students in schools offering instruction in cost accounting. There were approximately thirty entries this year, and the quality of the theses submitted was unusually high. The title of Mr. Wall's paper was "A Study of Manufacturing Expense Accounts." Other theses submitted were: "A Cost System for General Building Contractors"; "A Cost System for a Chain of Retail Lumber Yards"; "Cost Accounting for an Aircraft Industry"; "Methods of Accounting for Waste in a Cotton Spinning Mill"; "Service of Costs to Standardization," and "A Cost System for a Biscuit and Cracker Manufacturing Co."

Lewis E. Meyers Co., Valparaisa, Ind., have secured temporary premises in Woodstock, Ont., and will manufacture their line of portable desks for children. If the Canadian market proves attractive, company propose establishing a permanent Canadian plant of their own.

Officials of Furniture Manufacturers' Association who are Making a Tour of Ontario.

N. M. Currie, Manager, St. Mary's Wood Specialty Company

Quality of Product Ensures Market

Interesting Outline of the Activities of the St. Mary's Wood Specialty Co., St. Thomas, Ont.—Have Developed Special Automatic Equipment to Facilitate Production of Their Many Lines

In every particular line of manufacturing enterprise it is worth that tells, and the house that has the goods, and the company that makes them are the ones who are always sure of an extensive market. This is strikingly illustrated in the St. Mary's Wood Specialty Co., Limited, one of the important industries of St. Mary's, Ont. This industry was established in the year 1908. The plant is equipped for the manufacture of high-grade wood specialties, such as ice and field hockey sticks, ball bats, Indian clubs, etc. A special department is devoted to the production of high-grade pick, axe, sledge and small hammer handles, the quality of which, the makers declare, is unsurpassed in Canada. Canadians are a working people, although they dearly love athletics. Hockey is a great winter pastime and baseball the premier summer sport, but the axe, pick and sledge still hold sway over the hockey stick and the ball bat.

The casual reader may wonder what these observations have to do with the woodworking industry. Simply this, that while the plant of the St. Mary's Wood Specialty Co., Limited, has a capacity of 20,000 dozen hockey sticks a year, in the department of more utilitarian agencies of civilization and national expansion, such as axe, pick, sledge and hammer handles, the industry has facilities for double this output. This may be interpreted that Canadians are still toilers, much as they love recreation and diversion.

Special Equipment Developed

The factory of the St. Mary's Wood Specialty Co. is modern in every respect, and, notwithstanding the present depression, is running in all departments, although, of course, not as fully as last year, when no less than twelve carloads of hockey sticks were shipped to all parts of the Dominion and many states of the Union, particularly in the North.

The head of the concern to-day is N. M. Currie, through whose initiative and energy the industry has largely been built up to its present proportions. Mr. Currie is the inventor of several time and labor-saving machines, which have greatly increased production and reduced overhead expenses. "This is the age of invention," he declared. "Hand methods are too slow and costly. We now have the largest factory in Canada for the manufacture of hockey sticks, and we believe that our equipment is unsurpassed."

The trade mark of the firm, with crossed hockey sticks as a background and surmounted by a shield on which are the words "Quality and Service," is well known, and the slogan is "That which is worth doing at all, is worth doing well." The company makes a specialty of manufacturing hardwood handles and hockey sticks from the raw material as it grows in the forest to the finished article. The sticks made by the firm are manufactured chiefly of rock elm, which grows in scattered stands throughout the district surrounding St. Mary's. The pick, axe and sledge handles are turned out of hickory, maple and white ash, while all smaller handles are made of hickory. The rock elm is brought to the company's sawmill on flat cars or hauled in by farmers during the winter months. Many portable and small sawmills cut exclusively for the firm, who have been able to obtain enough rock elm to meet all their demands. Sawing the logs is generally begun in February or early March in the company's own mill, and they are cut up on the circular saw to widths of three and a quarter inches. It is found that during the early, cool spring months the wood seasons much better and more rapidly than when the hot weather arrives. The time required for proper seasoning is from four to five months.

How Hockey Sticks Are Turned Out

The logs, which run from 20 to 24 inches in diameter, are piled on tram cars, which are drawn by a cable up to the saw carriage. After being adjusted on the carriage, which is hand-set and operated by a cable release, the logs are sawn in the thickness desired. The standard widths, as well as the slabs, travel over live rolls back to a butting saw, where the material is cut to length and placed on an elevator, which carries it to a track connecting the sawmill with the factory.

The material is cut into billets or blanks and piled to season for three or four months. The next process in production is reducing the billets to proper size for operation through the bending machines. Before being bent they are put into a steam retort at thirty-five pounds pressure and left there for about half an hour. Next the billets are placed in either single or double bending machines, a zinc shoe being affixed at one end of the billet, which is bent to form the blade required for hockey sticks. This process is most interesting, and to see the rock elm curling up at one end or both without breaking, by means of steam pressure, affords some idea of the strength and fibre of this hardy forest product.

The wood is next seasoned until quite dry and then

the bent billets are run through automatic ripping machines, which cut the strips to the required thickness and tapers them. After this they are marked out to the various forms desired. The stock then goes through a band saw and is cut to the various shapes described by the forms. The old system of employing drum sanders for finishing has been abandoned and new, improved, automatic machines for doing this work at much saving of time and expense have been substituted. These special machines also improve the shape of the handles by keeping them straight. The automatic machines first properly bevel the blades and next the finishing and sanding, all in one operation. They are so simple in construction and easy of manipulation that two boys can do the work which it formerly required several men to execute.

Hockey sticks are turned out in eight different grades, including those of the short shape handle used for playing field hockey. The process of grading is carried out by means of a rack with sections corresponding to each of the qualities. The sticks are then taken to the labeling room, when they are tied up in bundles, six sticks to a bundle, and are subsequently crated in standard crates, six dozen handles to each crate.

A quantity of material not suitable for making hockey sticks or large enough for the general lines of the company, including slabs of rock elm and maple, are cut to the length necessary for making axe and pick handles. This material is run through the billeting machines and the portions large enough for converting into handles, are cut to the proper dimension. The offal is used for fuel for the boilers of the company.

Dimension Stock for Handles

The imported and domestic hickory for the regulation handles is cut to dimensions in the various mills from which it is obtained, and the product shipped in in car lots and stored in proper rooms until it is worked up into the finished article. When used this stick is elevated by conveyors to the second storey of the factory, where the machinery for turning out all straight handles is located. There is another conveyor for irregular shaped handle stock, which is run into the storeroom by gravity carriers, where it is piled until needed.

The first process in making straight handles is in putting the stock through a double equalizing machine which cuts it into uniform length, after which it passes through either one of two large lathes, which have been set for any of the lines made in pick, sledge or small handles. The blanks then drop through a chute to the ground floor and are placed on trucks and taken to the sanding belts and passed through the different grades of coarse and fine sanding until they are in a condition to be waxed, after which they are put on trucks and elevated to the second floor, where they are labeled and crated.

The irregular stock, such as axe handles, is stored in a different section from the straight stock. The billets are marked out to the several desired shapes by means of forms of special design. The irregular shapes are next cut out on hand saws, after which they are passed through automatic lathes and finishing machines in much the same way that the regular straight lines are produced.

Power for the company's sawmill is furnished by a 100 h.p. engine, while the motive equipment of the woodworking plant consist of a 75 h.p. steam engine and two motors of 20 h.p. each.

Good Wages and Free Labor

It was pointed out recently by Governor Ephraim F. Morgan of West Virgina, in a statement in the New York Commercial, that 40% of the bituminous coal produced in this country is from mines where non-union labor is employed. He says, in speaking of the leaders of the United Mine Workers: Under the present wage scale they have found it an impossibility to lessen the tonnage from the non-union districts." After a long course of rioting and murder which received countenance or apology from the national leaders, developing into an armed insurrection which only the United States Army could suppress, these mine leaders discovered more than the governor ascribes to them, or at least would have found it if they possessed an intelligent sense of proportion.

They themselves had stimulated the non-union production by the encouragement of loafing, costly labor conditions and excessive wage demands among union workers. The per capita production of the non-union miner is far greater than that of the unionized worker. His labor conditions are eminently tolerable, his net wages are as good or better, and he has practically continuous work against fewer days a week in the unionized districts. When will labor begin to understand that a union is a means and not an end? If the workman can secure better conditions in the open shops of the United States Steel Corporation, is it any wonder that 93% of that corporation's employees were not in sympathy with the indefensible strike of two years ago? To judge from the utterances of some labor apologists, and more particularly those who carry their half-baked economics into the pulpit, a strike is something good for its own sake and a union is an end in itself. Everybody is looking around for signs of better times. The non-unionized miner is one of them, and he is getting big wages at that.—Barron's Weekly

Retail Stocks Are Depleted

Stocks of general merchandise probably never were lower than they are to-day. Merchants and dealers everywhere began cutting down stocks because of necessity about a year ago and have been at it ever since. Nobody cares to place orders for future requirements because of the feeling that the price trend is downward. One result is that New York, Chicago and other centres are swarming with out-of-town buyers who need goods in a hurry. "Buy little and buy often," is the current slogan. Production, consequently, has been drastically curtailed in many directions. There is at least a possibility that the universal lightness of stocks on shelves, combined with under-production, will one day—and that perhaps before long—bring a complete change in the price trend. As a mater of fact, the consumption of merchandise in this country has not decreased so very much, if any. Let something happen to transform sentiment from pessimism to optimism, and lively times are likely to develop.—Forbes.

How One Saw Was Made to Cut

Operator Surprised When Suggestion Was Made to Remove Large Number of Teeth — Successful Operation Depends Upon Proper Spacing of Teeth

By W. J. BLACKMUR

I went into a friend's factory the other day, and found that he was having trouble with his saw. True, it was a one-horse show, one might say of even less power than that, still, in spite of it being of trifling importance, the trouble to him was, indeed, very real. He had bought an electric motor and a small saw bench which took an 18 in. saw. The saw in the bench was 13 in. and he was trying to cut some 4 in. fir with it. He was cutting it, but at the cost of a large expenditure for electrical energy, and a considerable tax upon his patience. I do not know which was the most expensive. He wanted to cut a four-foot, 4 x 11 in. plank into ½ in. x 4 in. strips. No great task about that. It is often done in the manual classes, and it should not have proved so difficult to my friend.

I asked him what was the trouble. The first trouble was that the belt would run off the pulley. The next was the amount of power the saw took, and the slow way it cut. "I cannot understand it at all. I chose the saw because it had so many teeth in it, and my cousin, who is a blacksmith, told me tha tthe faster I ran the saw the quicker it would cut. You try the saw." I did so. It was just humming round somewhere between four and five thousand revolutions per minute. It just whizzed. "It is going some," I said. "Yes, there is no doubt about that. I was determined that it should not be for want of teeth or the speed of teeth that the saw should not cut." "So it seems," I said. "Stop the saw and let me see the teeth." He threw the belt on to the loose pulley. Then I saw that the saw was five teth to the inch. Five teeth to the inch used for ripping purposes. "If that saw and that speed does not make for fast cutting, I wonder what will," he said. "You are not reasoning on logical propositions," I answered. "As a matter of fact, and of practice, you have made the conditions so it is very difficult for that saw to cut. Why, you won't allow the teeth to get a bite in the wood before you move it out. The teeth have no chance to cut. Why, there I will show you," and I put the belt again on to the tight pulley.

Knock Out Nine Teeth

"The saw is moving so fast that it is impossible for the teeth to get a bite out of the wood. If you intend to run this saw at this speed, then knock out nine teeth and leave one. There will be less for you to shapen." "Why you must be daft to imagine just such a thing." "Nothing of the sort. Let me say that if I do not make any improvement in the saw by knomking out those teeth, I will buy you a new one similar to this. I ask nothing in return, only I want a fair chance for a saw. You are not giving it to this one." "You will spoil it. Why it stands to reason that the more teeth you have in a saw, the more or rather the better it will cut." "That is only a rumor. It is not a fact. Come bring me a chisel and a hammer and I will turn dentist." With considerable reluctance these tools were given me.

Judging from the look on my friend's face, he ought to have had chloroform while I did the surgical operation on that saw. It was soon done, and the saw was minus a great many teeth, which lay on the mill floor. Every two inches was a slight projection. This was the odd tooth which had been left in to do the work of ten teeth.

"You don't suppose thath saw will cut now," said my friend very anxiously. "I don't suppose anything at all about the matter. I know that those points two inches apart will do better service than the odd ten teeth, which stood there before I cut them out of the saw. It would be best to put in proper gullets, but even before we do this, I want to show you that you were making a great mistake in your reasoning. There were so many teet that it was impossible for the saw to really cut. Those teeth could not cut because there were too many teeth. Sounds like a paradox, yet it is thes imple truth."

I put the saw in. It did not look like one, just a circular disc of steel with a few points showing every two inches.

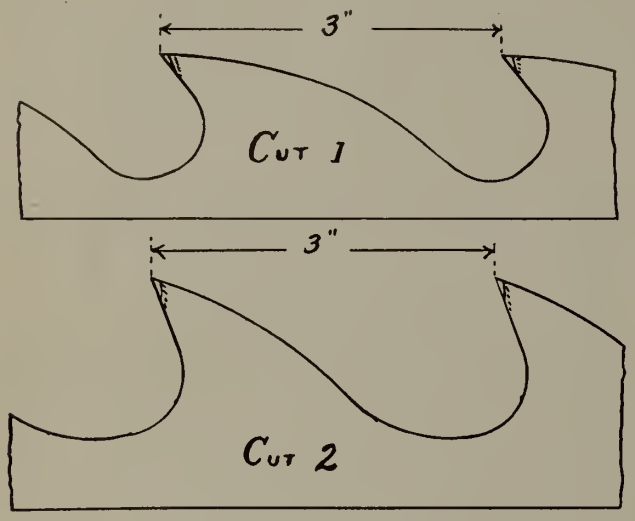
Must Take Hold of Wood

You pull the saw back, I suppose, when you put it in with the pin on the top. This keeps the saw in the same position every time you put it in or out. No little item, I can assure you, if you want the saw to do first-rate work." I fastened up the nut, then let the saw run. It still whizzed, indeed, it seemed to whiz more, judging from the sound. My friend picked up cut and looked with amazement at the way the saw cut the wood. Before he had to push quite hard. Now the saw cut it quite freely as though it was fond of the job and had no objection to what it was doing.

"I cannot understand it," he said. "Why, it was such a difficult matter to make that saw cut. Now it will go through the wood quite easily." "It will be better yet. Even now the saw is not cutting at its best. At the speed you are running I should have put in teeth every three inches and have given it a gullet so fast that not one had a chance to cut."
a saw. There were so many teeth in it and they moved it was a steel disc you were pushing against instead of which would take all the wood such a tooth would make. However, I did not want to alarm you, so I just knocked out the teet hso it left 2 in. teeth. What is needed is a tooth which will take hold of the wood in front of it and remove it all the time it is going through the wood. Your fine tooth saw did not have that opportunity. It just took out the smallest of fragments, then there was no more work for it to do. Why it seemed when you were working it as though the part of the 4 in. x 11 in. piece which had not been

There is another item with the teeth that wonts altering. If you remember those teeth were upright and the tops went down to the bottom of the gullet. Now I should alter the front of the teeth. The average man imagines that if the tooth has a sharp point to it, it must cut. It is a mistaken idea. It is not a sharp point that is needed, but a sharp edge. A point is

obtained by filing or grinding a tooth, so it has a bevel on the front and one on the top of the tooth. This is excellent if you simply want to stick those points into the wood, but you want to do other things than that. You want to remove a piece of wood the width of the saw. This can be only done by making a chisel tooth, not by making the teeth so they are a series of revolving points. If you want a saw to cut very easily, and every man who works a saw wants that, you must make the teeth like a series of chisels if you want them to cut easily. Each tooth must take ont its part of the wood and work all the time it is in it. It can only do that by having the teeth arranged according to the speed of the saw. If, for instance, you ran the saw at twice its present speed, it is now exceeding its proper limits for a 2 in. tooth; then, instead of increasing its power for cutting, it would lessen rather than increase it. It would be necessary to have the teeth 4 in. apart to give good results. The faster the speed, the wider



High backs consume power.

must be the teeth space, so each tooth can do its maximum amount of work. It is also important that the rake or the front of the tooth should be an acute angle. It does not matter so much about the top o fthe tooth, providing, of course, that it has the proper clearance.

Keep Backs Down

Only a short time ago in the "Canadian Woodworker" a writer derided the idea of having acute angles for the front of the teeth, and claimed that when he ground down the backs of his teeth and altered the rake in front to a less acute angle, he saved a great deal of power. Luckily he sent two rubbings of the teeth before and after. The first set was of the teeth before it was touched by theg rinding machine; the second was after he had ground back the front and ground down the teeth of those saws.

One would imagine after definite statements like these, that there was a great deal in what he said. It was against all my experience, and I looked very carefully to see the nigger in the wood-pile. I was not long in discovering that dusky individual. He was lurking right in front. I took a straight edge and laid it along the tops of the teeth. It will be remembered the drawing was taken from a rubbing of those teeth. The straight edge showed that the backs of the teeth were level with the front. One or two teeth seemed higher at the back than at the front. It meant that the saw had a good deal of unnecessary friction put on it when it was sawing. I could see that quite easily, and while his statement was correct that the altered grinding of tops and backs of the teeth made a considerable difference in the power, it showed that he had reasoned on false premises. If that writer had just altered the tops of those teeth instead of the fronts and tops, he would have increased the usefulness of that saw.

For circulars more than band saws or gang saws, it is very important that the teeth should be chisel shaped. They should go into the wood and take it out, not as so many teeth do simply rub off a small fragment, then pass along the wood because there is no more wood to cut.

Hold First Annual Meeting

The Association of Wood Using Industries held its first annual meeting in Chicago on September 26th. According to the reports presented, the association is comprised of eighteen different units, dealing with many branches of the woodworking industry and representing some six thousand individual manufacturers.

In outlining what has been accomplished during the first year of its existence, the president of the organization, E. E. Parsonage of Moline, Ill., claims that the association of Wood Using Industries has more than justified its existence. Work has been undertaken along a number of lines which may form a basis, not only for a national reforestation policy, but also for legislation and a plan of co-operation between the purchaser and consumer of wood products.

Through the efforts of W. A. Babbitt, secretary of the National Association of Wood Turners, the handle manufacturers of the States have simplified and standardized their wood requirements. The standardized sizes have been adopted by the National Hardwood Lumber Manufacturers' Association, with the result that any sawmill operator is quite safe in working up his low-grade material into standard dimension stock at the same time be assured of a market.

The following officers were elected for the ensuing year: President, E. E. Parsonage; vice-president, H. P. Baker; treasurer, F. A. Vogel; secretary, Wm. B. Baker; executive committee, the above officials, together with W. A. Babbitt, John Foley and W. H. Davis.

Is Pessimism Overdone?

It may be true that everybody is hard up, but there is a lot of evidence to the contrary. Travel records this summer compare favorably with those of any boom year. The better summer resorts are crowded. People are turned away every day from the highest priced hotels in New York. There is a scramble at every meal for seats in the most expensive restaurants. The amount of betting on horse racing is said to be eclipsing anything ever known before. Merchants report that the demand is chiefly for the better grade of goods, although it is true that many customers now shop around until they find attractive prices. Until the very warm weather set in theatres were crowded nightly. Automobile makers have been reporting active business. Savings bank deposits have been breaking all records. Every first-class cabin on boats bound for Europe is engaged. May it not be that most of us are not really so very badly off as we have become fond of proclaimng?—Forbes.

Enemies Without and Enemies Within

Box Industry Suffering from Competition Among Wood Box Makers — This is One Line Where Cut Prices Do Not Create New Business—A Plea for Better Conditions Among Individual Manufacturers

By B. F. MASTERS
Chairman National Association of Box Manufacturers, Address before Convention at Atlantic City.

There is an old saying that there is strength in numbers. I feel to-day that there is strength in representation, territorial representation. When I see a represensation here from the West and from the East and from the Central States, I feel that you are actuated by some real purpose, that you have come here because you have an interest in the industry which you represent. Therefore, I shall take but little of your time. First of all, silence is golden. Secondly, it is economy because every word I say to you is taken down here and will cost something to record in the official minutes of the Association, and anyhow, you didn't come here to hear me or anybody else talk, except to gather the facts pertinent to our industry. When I say "our," I think we all have a common purpose in mind and that is the improvement, as far as possible, of the situation that surrounds the industry in which we are all engaged.

I am not much interested in discussing with you the past because that is an open book, and in some respects the less said about it the better. I am not able to discuss with you to any great extent the future, because I have no knowledge with respect to the future that you gentlemen don't possess. I have no means of determining the future, except by the past, and only in so far as it affects the future, I take it, are we very much concerned in the past. We are dealing with facts as they exist to-day. We are living in the present and we are manufacturing boxes in the present, and I take it, most of us are selling them in the present, though some of us may be making future sales. I doubt that, however, and the things we are most interested in are the real, live, pertinent issues of to-day that surround our industry.

Take an Optimistic View

We are all interested in forecasting the future as far as possible, and in so far as we are all able to see, I believe, judging from those with whom I have conversed, that we are all rather optimistic. I am as much of an optimist as the general nature of business conditions will justify, perhaps a little more than I can justify in my own mind, but it seems to me that we are all approaching the situation to-day with a feeling of optimism and with the belief, I am sure, with the hope and possibly with the belief that we have passed through the worst of the depression that has been forced upon us in the last year.

The general business situation as far as I can forecast it, seems to indicate that we are all a little better off than we were a few months ago and that the situation is therefore more hopeful. The Government reports of crops indicate that we are going to have a splendid crop, taking al the agricultural products of the country combined—perhaps not quite so great as last year, but yet sufficient to justify and encourage us in the belief that good times o rbetter times are ahead of us.

In our own industry I have always maintained that that our box situation and box business was somewhat a barometer of general trade conditions and that you can't sell our product because times are good or because times are bad except as there is a demand for the thing that we have to offer for sale. People don't buy the product that you gentlemen manufacture unless they have something back of that which demands that particular thing in which to ship the products of the various factories and mills and industries of the country to whom you look for your trade. Therefore, you are perhaps a more direct barometer of industrial conditions that many other industries that are more remotely related to the business situation as it may exist in a particular time.

I take it that having come here from all directions from the East and from the West, you have come here for a purpose—of informing yourselves as to the business situation and as to the conditions surounding your trade and your industry, and anything I may say to you will, of necessity, have to be borne out by the facts that develop but I hope that while we are here we may devote ourselves to the objects we had in mind when this meting was called—that is, to discuss fuly and freely and frankly the fundamental and underlying conditions of our industry and try to acumulate and disseminate as much information as posible with reference to our particular industry, and I hope that we don't absent ourselves from the room until we feel that we have acomplished that thing, till it's over with.

I read a little story this morning about the Englishman who walked down a certain street in Boston and saw a sign out over a cafe or restaurant that said, "Beefsteak." He walked in and seated himself at a table and said to the young lady who came to take his order, "I believe I will have some beefsteak."

She came back in a moment and said, being Boston, "The beefsteak is over."

And being English, he said, "Over what?"

And true to her traditions, she said, "Over with."

Now, I hope we may devote our time and attention to the business here until it is "over with" and that we may have the attendance and attention of every man that is registered here.

Competition From Within Industry

I haven't anything to say about the future because, as I have said before, I know of no way of judging it but by the past and judging by the past I can't offer you any great encouragement, but my conclusion is that in the every-day course of our business affairs the one great thing that we are mostly interested in is the question of the price of our product. I take it that you are all more interested in that than you are in the volume of your sales because you can't create a market for your product beyond the demand that is occasioned by the business condition of other interests, but you can have some voice in the price at which you sell your product and I am forced to this conclusion in talking

with gentlemen here and in my observations far and wide, that the prices that prevail to-day for the commodities that you gentlemen manufacture might be largely improved and largely controlled by your own efforts, that your competition and the regulation of your prices comes from within this industry and not from without.

Reflection of General Economic Conditions

We have said a great deal in the last several months, in the last year or two, with reference to liquidation and with reference to the conditions that are forced upon us on acount of the world war through which we passed many months ago, but which still leaves its impress upon our minds and upon the conditions of trade in general. If this were a situation that the United States alone were concerned in, I do not think we would have had the measure of depression that has been forced upon us, but the condition that obtains in the United States and in our country obtains throughout the entire civilized world and if you will stop to think that these conditions obtain in a great measure and to a greater extent in European countries than they do with us, you will more easily understand the diffculty that we in the United States have in regulating our affairs to the conditions that were brought about as a result of the late war.

Fundamentally our demand depends somewhat on the requirements of our export trade and with the conditions fixed upon European countries by virtue of the peace adjustment, we are confronted with the condition of having to meet prices that are forced upon us in the manufacture of many articles that are exported from European countries to the United States, and since our labor leaders, whether union leaders or otherwise, have triad to impress labor with the necessity of maintaining the high wages that prevailed during war times, we have been forced to meet the condition that is almost impossible in that labor has studiously demanded the same measure of compensation that it did during war times when labor was scarce and when prices were high and we find that condition existing in union labor to-day—that they are reluctant to in any extent meet the depressing conditions that surround our manufacturing interests and those of us that have to deal with union labor find that condition very much more acute than those of you who are located in sections where union labor does not control or dominate.

Taking Other Fellows Business

But as I have said in the beginning, this competition and this matter of making low prices and trying to underbid our competitor all comes from within our own industry, not from without to any great extent. That seems to me to be occasioned by a desire on the part of so many manufacturers to keep their business on a little higher plane than that of their competitor, a reluctance on the part of the manufacturer to assnme his full share of responsibility for the depression of business and to operate his plant upon the basis of the general demand for the product which he manufactures.

As we used to say, we used to put it that "some of us feel we have some advantage over our competitor and that we can go out and build our trade up and spread our overhead over a greater amount of business and therefore reduce our costs without ever giving a thought to the condition that surrounds the man whose trade we take."

I don't think there is any business in the United States for boxes or shooks that somebody, at some time, has not supplied and that somebody doesn't now claim as being their trade, and whenever any man in this room or any man in the industry, whether in this room or not, thinks that he can surround himself with a better condition by going out and taking that trade at a low price in order to spread his overhead over a great amount of business, he is injuring the industry just to that extent that he is taking trade away from somebody else, which forces them out either to take additional trade to substitute for that or meeting the price that the other man has quoted, and my observation has been this (and it has been brought home to me directly) that where we have (I am speaking personally now) where my company has reduced a price to hold trade that it has enjoyed for years, I have been accused of being a price-cutter and accused of making ridiculously low prices and selling my goods at less than cost, and I have done it. Why? Because I have tried to hold the trade that I have supplied for years and years, and which I feel that I have developed and have as much a right to as anybody else.

Tendency Is Ever Downward

Is there a man in this room who hasn't experienced the same thing? This is the thought I want to get before you, that when you go out to build up your business by taking trade from somebody else, you are doing a thing that is fundamentally injurious to the industry in which we are engaged, and, as I have observed and conversed with men in this industry, I find that the general tendency is amongst those who do not keep in close touch with us and who try to build up their trade from that which you have built up and accumulated and served for years, because they don't get the business they conclude that their prices are not low enough.

I heard a man say in a box meeting within the last 30 days, "Well, I have quoted prices below cost and yet my price is not low enough. I have quoted on a half dozen diffesnt trades, quoted below cost because I wanted business, and I didn't get the business." And I happened to know that man and I happened to know some of the trade that he quoted on, and in every instance he had tried to take some trade that he had never enjoyed before, and he had quoted a ridiculously low price in the hope of getting it, but the man who had it felt the necessity for keeping it so strongly that rather than lose it he took it at a loss, and in the mind of this man, whom I first described, you who quoted that price to hold your trade stood condemned of being a price cutter because you quoted and sold your trade below cost.

It seems to me an ethical conclusion that in depressions of this sort every man ought to be satisfied to serve the trade that he has been serving in times of prosperity through which we have passed—not so long ago that we may not still remember those days of prosperity when we had all the business we could serve and when we had trade that bought from us because we gave them service and not because we made the very lowest price that a man could possibly make, and if we will get away from the idea that low prices gets business and realize that service counts for something, then we have taken a step that will redound to the credit of our industry and also to our individual benefit and advantage.

Machinery & Equipment

Light Straight-Edging Saw

The Canada Machinery Corporation of Galt, Ont., recently placed a number of new saws on the market. One of these is their No. 613, light ripping and jointing saw. This is patterned after their well-known No. 611 straight edging and jointing saw, only being lighter in construction and embodying a number of refinements suggested by their experience with the heavier machine.

Some of the features of this new saw are divided chain, convenient control levers, large rigid bearings, saw held firmly between large collars, positive straight-lined feed, special shavings hood and special attention to safety features.

With a saw of this type it is possible to rip stock so accurately that it can be glued without any further correction. When a special joint, such as a V or tongued and grooved joint, is required, only the smallest shaving need be removed, enabling the stock to be

C. M. C. light, straight edging saw.

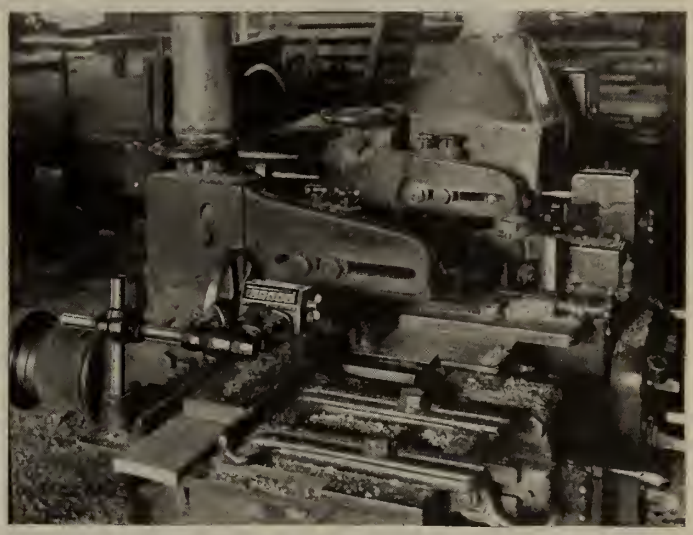
routed nearer to the finished size and thus making for a saving in material.

This lighter machine should satisfy the demand for a straight edging saw for plants which do not have sufficient heavy ripping to warrant the installation of the larger machine.

Lumber Meter Reduces Costs

Standardization is the topic of conversation among those interested in the woodworking industry to-day. It has been referred to as the foundation stone to modern manufacture. This refers not only to standard products and sizes, but also to certain standards on which to figure costs, job estimates, etc. These standards, while proven necessary to successful business, will be controlled largely by the efficiency of your equipment, your labor and your knowledge of your working conditions. There must be greater and cheaper production and a thorough and reliable record of costs when production standards have been established.

The lumber meter as shown in the accompanying illustration has done much toward speeding up production and cutting down costs. It has in many plants, as in the plant in which this photograph was taken.



Showing Durant Productimeter attached to sticker.

furnished records on which large savings have been effected. This meter is applicable to moulders, matchers, stickers, flooring machines and self feed rip saws, and can be used on either end of the machine.

It records automatically each foot of material going through the machine, thus furnishing figures, which are accessible at all times, of the daily or hourly production. From these figures it is easily determined which operators and machines are turning out the most and which the least. Over runs and under runs can be entirely eliminated by watching these figures, thus effecting a large saving of waste material and expensive set ups. It is usually considered indispensable after being used and its worth demonstrated.

Belt Sander With Large Capacity

The new Oliver No. 126 belt sander, as manufactured by the Oliver Machinery Co., Grand Rapids, Mich., is shown in the accompanying illustration. This is a general purpose machine designed for sanding and polishing various kinds of work, including line and edge mouldings.

One interesting feature is its range or capacity, for it is so constructed that it can accommodate work as high as 54 inches on the table, and work up to 72 inches from the floor plate. For this reason it can handle cedar chests, phonograph cabinets, desks and medium-sized pieces of furniture of various kinds, the table rolls on ball bearings, making it extremely light to operate. It has a travel of 36 inches, enabling the

machine to work to the centre of the 72-inch surface. The tension of the belt may be changed to suit the various classes of work.

The top, which is 32 x 96 inches, is constructed of stripe of wood with sufficient space between to permit of dust and slivers to fall through. An adjustable bar holds the work on the tables. The idler is adjustable

Special sander with unusual range.

vertically and may also be set in a tilting position so as to keep the belt running on the centre of the pulleys. These pulleys are wide enough to handle belts up to 14 inches in width.

An edging attachment is provided to attach to power stand arms. It consists of a belt plate adjustable table which can be tilted to 45 degrees up or down, as well as having a vertical movement. It also has an attachment for sanding form edge mouldings or irregular shapes.

The machine is equipped with roller bearing countershaft or may be arranged for motor drive. A special sanding pad attachment is optional.

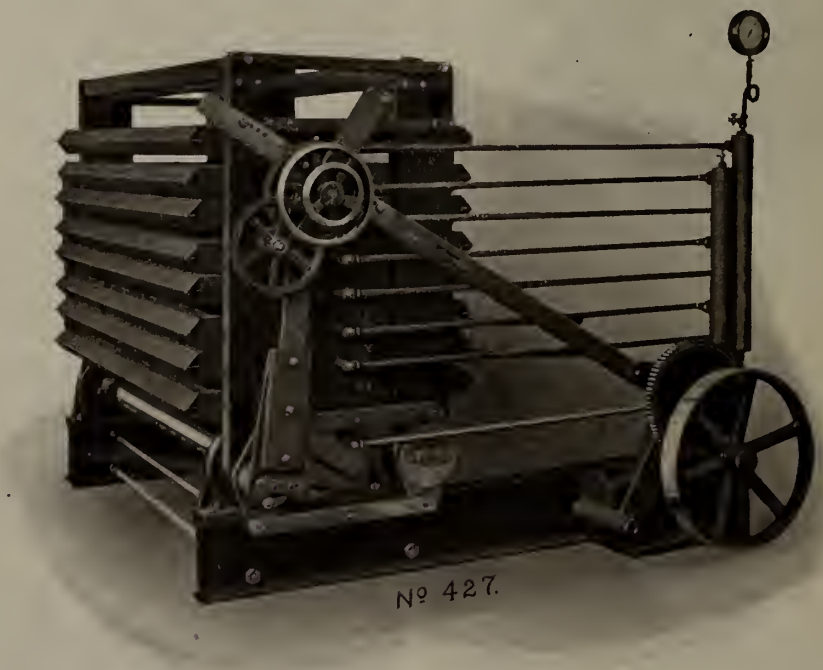
Merritt Veneer Re-drier

What is known as the "Merit Balanced Plate Veneer Re-drier" as manufactured by the Merritt Engineering & Sales Co., Lockport, N.Y., is shown in the accompanying illustration. In principle the veneer is dried between the hot plates which move up and down and alternately press and release the veneer. Owing to the fact that a certain amount of pressure is applied, the stock is straightened and at the same time the moisture is removed. Releasing the pressure momentarily also gives the stock an opportunity to shrink and thus prevents the formation of checks. If the stock were to be held securely and rigidly while drying, it stands to reason that as shrinkage takes place, something must give, with the result that checks appear in profusion over the surface.

In this machine a truck with rockers and posts balances two parallel frames which support the horizontal plates in two distinct series. In an 8-plate machine, for instance, with plates numbered from bottom up, the odd-numbered plates, 1, 3, 5, 7 are connected together and move as a single unit, while the even-numbered plates, 2, 4, 6 and 8, move as another separate and distinct unit. A movement downward of one series is made by a corresponding upward movemnt of the other series until contact between the plates is made in pairs, while spaces open betwen the other pairs. When the machine is reversed, contacts and open spaces change. This opening and closing is known as a "breathing movement."

This machine is made in various sizes to take veneers 60 x 56, 72 x 36, 84 x 54, 100 x 52 and 100 x 78. The number of plates vary, the standards being 8, 12 and 16. It may be had for either motor or belt drive.

There are several ways of dispensing with the loose pulley; one is to drive direct with an electric motor.



Balanced plate redrier for handling veneers.

Upholstering and Trimming

Modern Upholstering

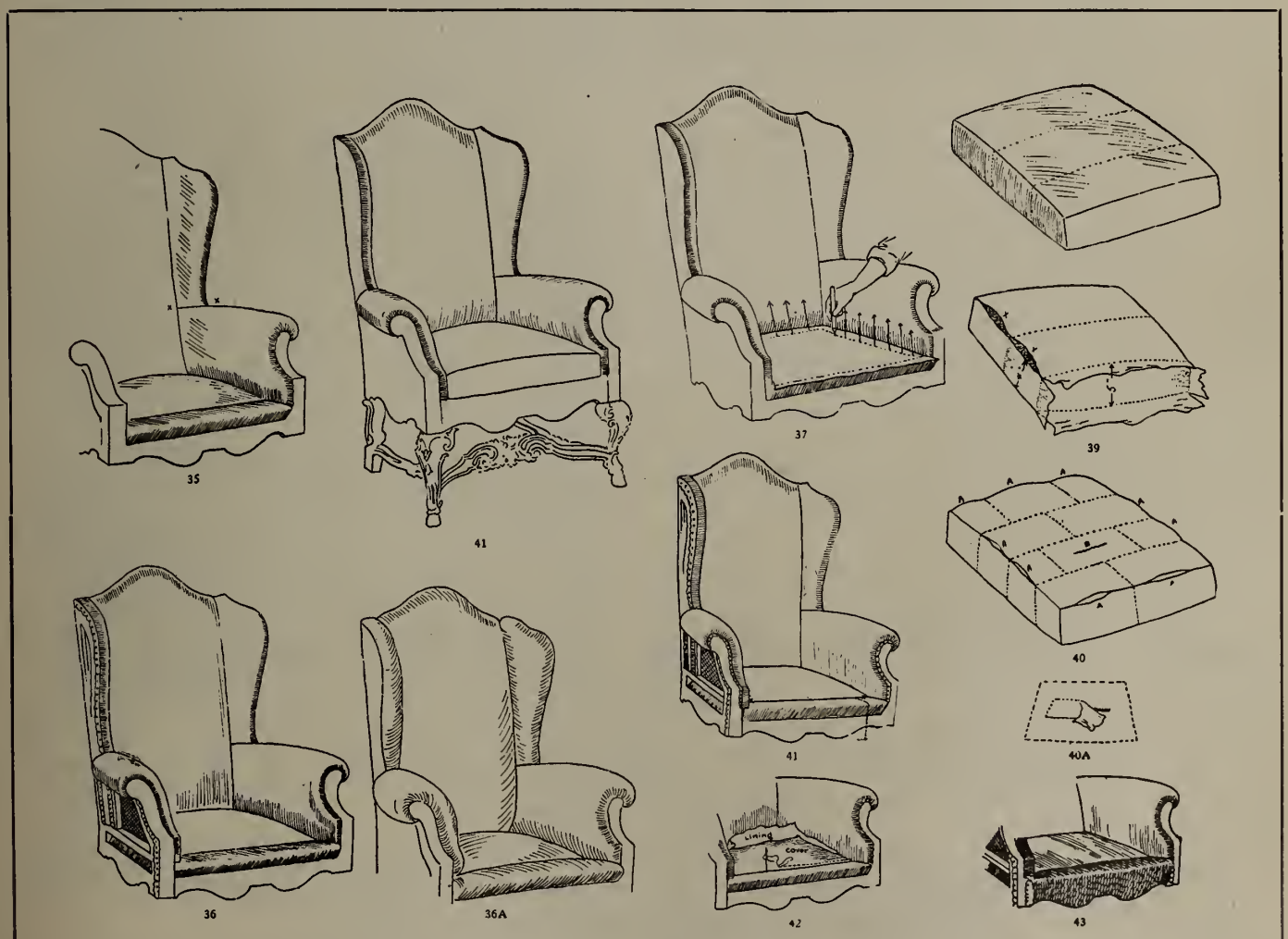
Lacing on the Hair — How Down Cushion is Made —Testing Quality of Material.

The next operation is the lacing on of the hair, as already shown, Fig. 34, and finally the covering with muslin to the stage illustrated in Fig. 35. Where the muslin of the wing joins the muslin of the arm, it will be necessary to sew the two together on the line xx, as shown in Fig. 35. On the completion of the covering also, it will be found necessary to have the material seamed at this point in order to provide the proper shape.

With both arms and both wings covered in muslin, the chair will now have the appearance indicated in Fig. 36. Just her it is well to point out the possibility of losing the symmetrical lines of the chair by upholstering that is too full or that rounds out over the edges of the frame. This possibility is indicated in Fig. 36a, where all of the sharp symmetrical lines of the chair have been lost, and bulbous, pillow-like outlines have been created. In this illustration the arms are too full, the front seat nosing too round, and the back and wings have lost the shapeliness which is characteristic of the original frame.

The chair is now completely upholstered in muslin, the outside arms and wings having been lined with muslin for display purposes, and the only upholstering yet remaining to complete the muslin stage is the making of the down cushion.

It used to be customary on chairs of this description to allow a recess at the bottom of the inside arms and at the bottom of the back for the down cushion to slip into. This is not, tolay, considered a good practice, but the arms and the back are finished straight down and the down cushion is made to fit into the



Successive steps for finishing seat and preparing cushion.

space between the arms. Therefore, a paper is smoothly laid over the seat, and with a pencil, held upright as indicated by the arrows in Fig. 37, an outline of the cushion is marked on the paper, and from this pattern the cushion is made the exact size thus indicated.

Down cushions are not, like buttoned cushions, made larger than the finished cushion is intended to be. On the contrary, they are made the exact size of the pattern with only seaming allowances added beyond the lines indicated in Fig. 37.

The filled cushion, as shown in Fig. 38, must exactly fill the space allowed for it, so that it will lie in place without being crowded, yet at the same time fill the seat without leaving any unsightly gaps or openings. Because of the nature of the down-filling material, it is necessary to divide the inside of the cushion by partitions which prevent the down from shifting its position when in use.

A cushion of the size indicated for the chair we are describing would have not less than two partitions are indicated by the dotted lines in Fig. 38, also in Fig. 39, which shows one end left open to more clearly show the location of the partitions.

These partitions, furthermore, are made on an average of one inch wider than the box edge of the cushion. Thus, in Fig. 39, the edge shows a depth of four inches, while the interior partitions have a depth of five inches. These partitions are sewn to the top and bottom of the case, but are not sewn to the edges. These divisions are filled, as indicated in Fig. 39, by leaving an opening at one edge of the boxing (see xx), through which the down may be inserted, they are then pinned together and sewn.

Larger cushions call for a greater number of divisions. These divisions, as in the case of the cushion shown in Fig. 40, must each be built separately. This cushion has partitions running in both directions, across and lengthwise of the cushion, as indicated by the dotted lines. It sometimes occurs, as it does in the case herewith illustrated, that it is not possible to fill all of the sections from the edges. The cushion shown in Fig. 40 has ten divisions, nine of which can be filled from the edges at the openings marked aa, etc. The tenth division, however, is an interior division and this can only be filled by a slit made at b, which is sewn together and after the filling covered by what in trade parlance is known as "a plaster," consisting of a piece of the same material as that of which the casing is composed placed over the seam and sewn all around, as indicated in Rig. 40a.

With regard to the material used as a casing for down filling, the finest down-proof sateen or ticking only should be employed, and a simple test of any material may be made by determining the degree to which it resists an attempt to blow through it. If, by holding the material across the mouth so that no air can escape around it, and then, by blowing, force the pressure of your breath against it, real down-proof material will be found to be practically airtight. If the breath passees through it easily to an extent that would extinguish the blaze of a candle, it is a safe assumption that the material is not down-proof and should not be employed for casing purposes.

With the cushion completed and in place, the chair in muslin ready for covering will now have the appearance shown in Fig. 41. If the chair is to be displayed for sale, however, the fronts of the arms would have a panel of muslin sewn on and tacked around the edge of the arms as a finish and the entire outside of the chair would also be covered in muslin.

These final details serve to present a better appearance when shown for sale, but the muslin linings require to be removed in the final covering of the chair, which will be described in a later chapter.

The previous paragraphs have carried the upholstering of this chair up to the point where it would be shown for sale, in the muslin, and subsequently covered. On the assumption that it would not be shown for sale in the muslin, the upholstering would stop when it reaches the stage shown in Fig. 41, which is practically the same as Fig. 36, except that the face of the arm is covered in the last mentioned diagram.

The first operation in the covering is, naturally, the seat. It is not customary to cover the entire seat with the furniture covering, but only that part which is likely to show under the edge of the cushion. For this reason, therefore, a piece of covering, wide enough to reach from the line x—x to the edge of the nosing and down to a point below the scallop, as indicated by the dotted line in Fig. 41, is sewn to a piece of lining large enough to cover the seat, and after being sewn together the two are stitched from the wrong side of the covering, as shown in Fig. 42, and eventually tacked into place as indicated in Fig. 43.

The back, arms and wings are also covered in the regular way. The chair has now reached the stage where it must be determined how it is to be trimmed, a matter which will be discussed in the next instalment.

(Continued in November issue.)

Why Tacks are Numbered

The question is often asked why tack manufacturers changed from the old system of marking tacks, 2 oz., 3 oz., 10 oz., etc., to a form which gives only the number as No. 2, No. 3, No. 10, etc. By some people it has been regarded as a move, on the part of the manufacturers, to decrease the number of tacks per box, as the old system represented the number of ounces per thousand of tacks; and some thought that the tacks, themselves, were different under the new system of marking.

The explanation for the change is best given in a communication we recently received from Samuel Salmond & Son: "We were obliged to change our method of marking tacks to conform with the law requiring all package goods to be marked according to their net weight. In old times, tacks were marked 1 M—2 oz., and this package, instead of containing 1,000 tacks, contained two ounces, and the number of tacks in the package was about 800. Now we have changed our packing so that we pack all of our tacks by net weight, and mark them either in ⅛, ¼, ½, 1, 5, 25, 50, 100 pounds, and specify the size by number. These numbers correspond in size with the old designations by ounces, and the tacks are exactly the same as they were heretofore."

Inasmuch as tacks are sold by weight, the present system of marking actual weight rather than a figure, which suggests a variable quantity, seems to be perfectly fair.

The foreman who gives his employer and his men a square deal is helping to solve labor troubles.

Can You Define Velvet or Velour?

Confusion Exists with Regard to Such Names as Velvet, Velour and Plush—Some Differences Outlined

In the upholstery trade there is no one question that is more frequently discussed than, "What is the difference between a velours, velvet and plush." In trade we regard a velvet as smooth finished, low pile fabric, and a velours as of a little higher pile, and a plush higher still, but technical writers make little reference to velours.

The manufacturers of upholstery materials almost invariably call their products as velvet or velours, the term "plush" being applied to the material made for the cloak and suit trade. It is a singular fact that this same thing that the manufacturers call velours, the railway purchasing agents call plush. Literally, velours is the French for velvet.

There is great confusion in the use of the terms, velvet, velours and plush. We talk about utrecht velvets, but if made in this country they would be called velours. An authority for a New England manufacturer claims that they only make velvets and plush, although most of their product is sold in the trade as velours.

Another manufacturer says there is no difference between velvet and velours. And yet the United States government draws a distinct line, claiming that velours are made with one warp and two fillings while velvets are made with two warps and one filling. Here is a distinction that is not generally admissible, but it is a distinction that finds place in the administration of our tariff laws.

Pile fabrics are distinguished from all other woven articles by their surface, which shows a series of short threads projecting from the body of the cloth and usually concealing the interlacing of the ground warp and filling. Irrespective of the particular method of construction, these fabrics are known as "cut" or "loop" (uncut) piles, according as the loops have been cut or left as woven.

Technically, pile rabrics are divided according to method of construction into two main classes: (1) Filling piles, which are made with one warp and two fillings, producing velveteen, fustian, corduroy and velours, and (2), warp piles, which are made with two warps and one filling, producing velvet, plush, astrakhan cloth, etc.

Silk pile fabrics are mainly of the warp pile class, various kinds of velvets and plushes; and as a rule, only the pile of the fabric is of silk, while the ground warp and weft is of cotton.

Plush is constructed in a manner similar to that for velvet, but the pile is usually longer and less dense. In the U. S. tariff law of 1909 an attempt was made to differentiate between the two as follows:

"The distinction between plushes and velvets shall be determined by the length of the pile; those having pile exceeding one-seventh of an inch in length to be taken as plushes; those having pile one-seventh of an inch or less in length shall be taken as velvets. The distance from the end of the pile to the bottom of the first binding pick shall be considered as the length of the pile."

Velvets and plushes are woven as double-pile fabrics, i. e., two cloths are woven at the same time, one above the other, connected by the alternate interlacing of the pile-warp threads. A knife reaching from side to side of the loom cuts the pile halfway between the two cloths and leaves each with its own half of the pile. In Europe, velvets are sometimes woven over wires, but this necessitates very slow production. This method is occasionally used to make uncut velvet, but is more largely employed in making brocaded velvets for upholstery and for rich opera cloaks; in the latter case the wires are furnished with knife edges that cut pile loops, according to the jacquard design, as they are withdrawn. If a velvet shows cut-pile figuring with satin-woven ground, it is always a cut wire velvet; but American manufacturers obtain brocaded and other effects in a cheaper way after the cloth is woven.

In some cases the design is cut out in the pile by machinery that cuts close down to the ground; in other cases the design is produced by burning out, by means of suitable acids on the raised portions of rollers working on the back of the cloth, the binding of certain sections of the silk pile that are then brushed off the face. Another effect, sometimes used in making silk as well as mohair car-seat plush figuring, is obtained by stiffening terry woven pile, using heavy presses to stamp down the design, and then running through a shearing machine; when finished the pattern appears in loop pile and the ground in cut pile of the same height.

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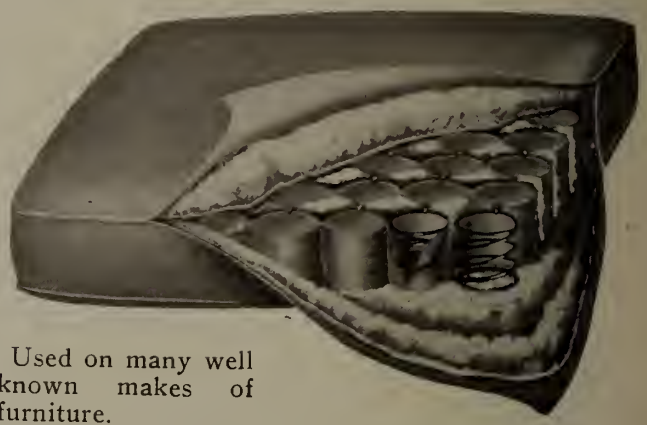

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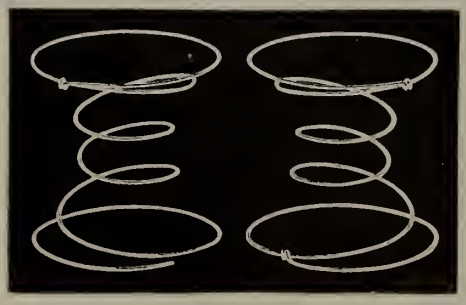

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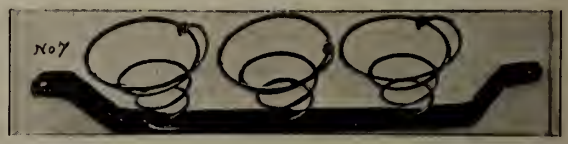

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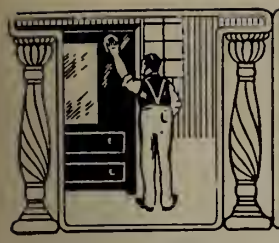

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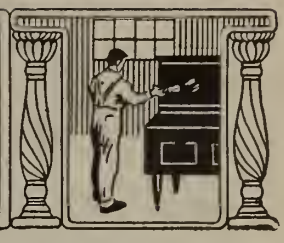

Getting Results from Varnish Sprayer

Cause and Remedy for Pitted Surface—Regulating Air Pressure—Should Varnish be Warmed?

By ARTHUR DEAN

Several years' experience in investigating troubles with varnish finish arising from application by the spray method, using equipment of various makes, has brought to light several common errors that are frequently at the bottom of unsatisfactory results. In the hope that an outline of these, and some suggestions on spraying technique in general, will be of value, these comments are written.

One common and a very serious trouble occurs with sprayed varnish, which is frequently called pitting and which develops as a kind of separation on the work, in which the varnish forms a lot of very small rings. An investigation usually shows this to be caused by oil or water in the pressure line. I have found that a careful examination of the defective work after drying will almost always indicate whether the trouble is caused by oil or water. If the rings seem to have a small speck in the centre it is a sign of oil, and this can be verified by rubbing down some of the work. If rubbing shows the varnish around the rings to be soft and imperfectly dried, it shows oil. When the trouble is due to moisture it does not seem to cause any difference in the drying.

Excelsior in Auxiliary Tank

The remedy is to locate and remove the cause, which can be done by investigating along the following lines. The compressor air tank should be drained daily, and particularly in the morning, by opening the drain cock before starting the compressor. Leave the pet cock open for a few minutes, and when oil and water are thoroughly drained, close it, and when pressure is up, open the separator or moisture trap on the spray booth and drain this also. Take care not to overload compressor with oil. It is always advisable to place the compressor lower than spray booth, so that a natural back drain toward the compressor will exist. If oil and water still give trouble after above suggestions have been carefully followed, would recommend the installation of a reserve air tank of 10 to 20 gal. capacity, located as near as possible to spray booth, same to be packed full with loose excelsior. The inlet and outlet pipes should be so placed that the air current must pass through the full length of the tank, preferably from bottom to top. This will reduce the velocity of flow of the air and furnish an effective medium for absorbing and condensing all suspended water, oil or dust that get past the other separating devices. This auxiliary tank should be emptied and repacked with fresh excelsior every thirty days, or more frequently when experience shows it necessary.

If pitting still persists, make a test by spraying a coat of varnish on a clean, dry glass plate, and if the film under these conditions shows pits, the varnish itself is likely at fault and a new lot or drum should be used. I have yet to see the first case, however, of pitting due to defective varnish as supplied by the established and reputable varnish houses. Occasionally a barrel of varnish is stored in a damp place or located where water from steam pipes or cold water pipes drips on it and finally penetrates through a leaky bung or partially-closed spigot, to the contents, causing a pitted finish. Such varnish can usually be put into good condition by careful heating, whereby moisture is driven out.

May be Other Causes

Should varnish film sprayed on glass dry O.K. and free from pit marks, the cause of the trouble can be looked for in the stain or filler, the condition of the veneer, or some other defective feature of the woodwork, in which case no amount of adjustment to the spray equipment will remove it. Another most important requisite to good work is the proper adjustment of the nozzle and the air pressure to the type of material being applied through the gun. Heavy-bodied varnishes (those with higher viscosity) in general will be found to require a higher air pressure than those of a thinner consistency. Heavy materials, as wood filler and iron filler, can be sprayed best with low air pressure (30 to 40 lbs). High pressures seem to blow the material off the work to be coated. It has been my experience that the use of the air agitator should be avoided in spraying pigment goods that are finely ground and will remain in suspension without it. This avoids the tendency to cause separation of the material that may occur.

Water and oil stains can be sprayed at very low pressure by using a small nozzle on the gun, so that excess material is not discharged.

The standard cuts of shellac and substitute shellacs require to be reduced and can be made to work nicely at 60 lbs. pressure, and the use of a smaller nozzle than for varnish is advisable and the flow from the container cut down. Do not hold the gun too close to the work or flooding is apt to occur.

In spraying the wood lacquers or products of similar manufacture and qualities I have found the clear goods to spray well at higher pressures than the colored, and if the coating in either case shows pebbly or sets up before flowing smooth, the pressure should be reduced until it does flow out.

Special Varnish for Best Results

Varnishes that give good results when brushed can often be made to give good results by spraying, provided the proper adjustment of nozzle and pressure and reduction is found. It is better and safer, however, to put the question of getting the right varnish for spraying up to the old-established houses, who have made a study of the subject and who offer varnishes especially adapted for the spray. Varnishes applied by brush and spray will dry and harden the same, pro-

vided the same thickness of coat is obtained, but the sprayed work will set up a little faster than the brushed. A varnish that sets up rapidly and fails to flow out can usually be made to flow by raisng the air pressure. It is well to remember that when the varnish manufacturer is called on to supply a varnish that will flow under all conditions, the only methods open to him in doing so are to supply a slower-drying material or to use a slower-evaporating thinner, either of which increases flow by reducing the rate of set-up.

Always follow the grain of the wood with the air brush, and never zigzag over the work, for by so doing a most uneven coat is the result. Start at one end of the surface and go clear across. When the brush is held at such a distance from the work that it seems to be applying a 6 in. wide spray, it really is covering solid about 4 in. in the centre, 1 in. on each side being blended out. Therefore, to secure an even coat it is necessary to lap over an inch or so in the next stroke across. Do not hold the brush 2 o r3 ft. away from the across. Do not hold the brush 2 or 3 ft. away from the work and expect to get good results; the proper distance depends on the surface, but for case goods and large panels 12 to 18 in. is about correct. Air pressure for varnish and enamels will vary from 70 lbs. up. On chair work this can be reduced, and also the flow of material at same time. When spraying taple tops or flat work, always start from the edge nearest operator and work away, which prevents blowing air over the surface already coated and assists in the flow.

There has been much controversy over the use of the heater in respect to the varnish, and my experience has been that this is not necessary except when the finishing room and material are cold, and I never advocate heating the varnish in the summer. When cold varnish is brought into the finishing room it should be allowed to stand about twenty-four hours to become thoroughly warmed to room temperature before attempting to spray it. The room temperature should be kept at the right point for proper working and drying of the varnish—about 65 to 70 deg. F. On special work, such as typewriter parts, and even fenders, very successful results are secured by using heavy-bodied black goods that have to be sprayed at 100 to 150 deg. in order to get them through the gun, but this is seldom the case with clear varnish work of any kind.

It is unnecessary to drain the varnish hose and container every night; in fact, it is better not to drain it. Have a can of naptha or gasoline at the side of the booth, and when through for the day put the end of the nozzle in it. In the morning wipe off the brush and start to work. If the hose and container are drained, a skin of partly-dried varnish forms and causes no end of trouble with dirty and lousy work. On the other hand, if hose and container remain air-tight, which is the case when the nozzle is placed in the can, no skin forms and the varnish in hose is clean. If it is absolutely necessary to drain the line at night, it must be thoroughly cleaned out with naphtha immediately afterwards. I have seen a most aggravated case of dirty varnish on piano work which was due to the use of a rubber-lined material hose that was not carefully and thoroughly cleaned each day. The turpentine of the varnish gradually softened the rubber lining, causing small particles to break off into the varnish and get onto the work.

Last, but not least, remember it is the "man behind the gun" who does the work, and to accomplish good results he must be interested in it and have the right kind of inducements and conditions under which to operate. Praise good work and correct the bad.—"Veneers," Indianapolis.

The Origin of Polychrome

The demand for the new polychrome or Italian Renaissance finish has been much discussed in wood finishing circles.

The fluted columns of the Renaissance period, with their many turnings and carvings, were often painted in various colors, which the centuries of storms and sunshine have dimmed until they are visible to-day through ad usty film. This is the origin of polychrome, and it should be noted that the ideal dim and dusty effect can best be obtained on work that is ornamented with turnings and carvings.

There appears to be such a general desire on the part of the furniture trade to learn something about the polychrome finish that we are outlining a simple method for securing this finish for producing poly-polychrome or Italian Renaissance on walnut:

1. Sponge the wood and when dry sand smooth.
2. Apply a coat of stain and let dry.
3. Sand lightly.
4. Apply a coat of lacquer.
5. Sand lightly.
6. Apply a coat of rotten stone or paste.
7. Wipe off clean so the color will show in the pore.
8. Allow to stand a few hours, then coat with our lacquer.

If a dull brown color is desired in the pore, use rotten stone in place of paste. It can be used either by mixing it in water or by rubbing on dry and wiping off clean. Note that rotten stone can also be used by mixing it with paste wax and rubbing in the pore, producing a good effect.

It can be left in that condition, thongh some want more life to the finish. This can be imparted by applying French lacquer. This lacquer can be applied with a brush or cloth. We recommend a cloth as it produces a softer effect and leaves less on the surface. This method will also produce good results on oak, chestnut, gnm, etc.

Economy in Purchasing Materials

When the finish means so much to a piece of furniture, it increases its saleability, enhances its appearance and denotes its quality—it is surprising that any manufacturer of furniture will take a chance with inferior finishing material when the cost between a first-class finish and a cheap one is so small. This is especially true when the difference in cost is compared with the total cost of the completed article.

It is difficnlt to make any appreciable saving in the cost of finishing a piece of furniture, that is, as far as the quality and price of material is concerned for a saving might easily be made in labor handling or method of application, and any saving made at the expense of the material used mnst invariably affect the quality of the resultant finish.

The point is this that in purchasing finishing material quality, not price, should be the deciding factor. A well-finished article will bring more money, enhance the reputation of the manufacturer and build good-will for both maker and dealer.

Some Suggestions on Staining

Difference in Waters Cause Variation in Results—Cloth or Sponge not Equal to Brush—Comparing Strength and Color of Different Stains

Stains are generally known by designations coming from the nature of the solvents which carry the coloring matter. We have water stains, oil stains and spirit stains, accordingly as the stains are soluble in such solvents.

Care must be taken in preparing the solutions. Water is the most commonly used solvent and the composition of water differs greatly. Some water is extremely hard. Some water contains magnesium, other water may contain iron, most water has lime in it and various other things have a part in the composition of water. The strength of the iron or magnesium or the lime may have a big effect opon the penetration and durability of the stains. Cleanliness of the various utensils used to mix stains is also of keen importance as the foreign substances allowed to remain in such by neglect may cause a different reaction than that sought. Water should be boiled or reduced from steam. Glass and earthenware vessels are the ones most used and guard against foreign substances. Hot water usually is better than cold, a fact made known by the use of it in the household for the solution of soap.

When dissolving a stain powder, first make a paste of it with the solvent, and when the paste is thoroughly mixed add the remaining solvent. This especially applies to water powders, which are sometimes difficult to dissolve.

When it is found necessary to reduce any kind of a stain, put in the reducer slowly, agitating thoroughly the contents when doing so. By using this system of reducing it will guard against the settling out, or precipitation of some of the colors contained in the stain.

Quite often, after the stain is applied, the surface of the wood is dry in some places and wet in others, and the man doing this work is apt to think that too much stain is on the wood where the wet places appear, and will attempt to wipe off the surplus. This is a mistake and will resultin a light place.

The reason for the difference in drying is due to the unequal absorption by the wood and the wet places are represented by hard growths and small pores. If wiping is necessary, og over the entire surface while the stain is wet.

To apply stain, have the brush as full as possible with the liquid, and then apply freely and evenly, with a long, full sweep, and allow to dry naturally. If the result shown is too dark or too light, then have the stain changed accordingly.

It is quite a common practice, in some finishing rooms, when applying stain, to use a sponge or cloth. This is to be condemned on general principles, because it is not practical nor possible to apply stain as evenly as when a brush is used. A brush method is more economical, also, as less stain is used.

Unlike the spraying of stain, which produces the same effect until all the stain is used up, dipping will result in lack of uniformity unless care is exercised. The stain must be kept of uniform strength, so that the last piece dipped will be the same color as the first.

Dipping stain can be kept of uniform strength by keeping a standard sample of the original stain used in the dipping tank and also having on hand strong solutions of the various ingredients used in the stain. By drawing off a pint simple of the stain in the dipping tank and holding it to the light, comparing it with a sample of the original stain, or staining two pieces of wood any falling off in color can be noticed. Another test is to drop some of the stain on a clean blotter and notice it spread. The different colors will form circles, the stronger colors spreading out further than the weaker ones.

These rings in comparison with rings made by a sample of the original stain will tell which color or colors need renewing. To bring the stain back to its original color, the pint sample drawn off from the tank should be brought to the same color as the sample of the original stain with the stock solutions of the different components of the stain.

Dipping stains should usually be made a trifle stronger than those applied with a brush because dipping does not "work the stain in," the way brushing does. When the articles are to be wiped the dipping stain should be stranger than when they are not to be wiped or the immersion longer so that the final effect will be the desired shade. It is more essential to wipe hard wood than soft wood because hard wood does not absorb the stain so readily, sometimes leaving air cells or patches when the immersion is done quickly.

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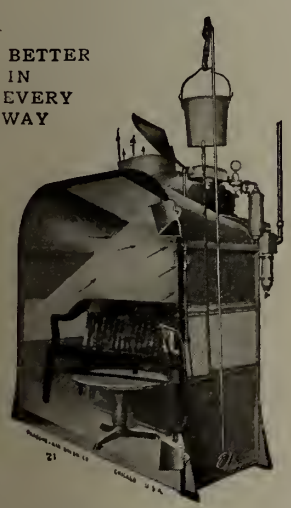

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Interesting Outline of Veneering Practices in Large Factory—Departures from Usual Procedure

By S. H. JOHNSTONE.

What others are doing or how others are getting results is always an interesting topic for an article. We are all interested in the methods in vogue in other plants and often we get a clearer insight into our own problems by giving a little thought and attention to the way in which our fellow-manufacturers have solved the problems and difficulties which confront us.

Probably no one deparment in a furniture or piano manufacturing plant presents so many problems and requires such constant supervision as the one in which the veneering is conducted. A little carelessness here, a little laxity and the accruing toll of checking, warping, blistering, loose veneers, etc., may run into a startling figure, especially if taken for a month or year. There is plenty of scope for improvement in the veneer equipment and methods as found in the average plant.

Have Earned High Reputation

The piano is generally looked upon as one of the highest developments of the woodworker's art. Just why this opinion should hold is hard to understand, suffice to say that when one is desirous of convincing some doubter as to the worth and permanency of veneer, the piano is usually used as an illustration and the older the piano the more forceful and unanswerable the argument. That being the case, a short description of the veneer department of one of the larger piano factories, touching briefly on the methods followed, may make interesting and instructive reading.

Probably one of the most notable features in this plant is the attention given to the core. Now what is considered most suitable for pianos should not be too good for fine furniture. In the plant we are describing, the cores must be practically perfect. Not good enough or passable good or even fairly good, but the best possible. This means that strict attention is given to selecting the stock for cores. It must be straight-grained, even-textured wood, free from knots, checks or any burls or cross-grained sections which might exhibit a tendency to curl. This does not mean that none but clear stock is purchased for core purposes, but by the time the material has been cut to length and the knots and other objectionable features eliminated, the remaining material represents a high grade of lumber. Right here is laid the foundation for the excellency of the product, for it is not practical to produce high-class veneered work unless the core is up to grade in every respect.

In the veneer department proper is to be found such machines as hot-plate redrier, veneer clipper, veneer jointer and veneer taping machine, all carefully arranged with regard to sequence of operation. This department adjoins the veneer storage room so that the raw material is right at hand. All veneer and rotary cut crossbanding is carefully redried in the hot-plate redrier before being jointed and taped. This not only ensures flat material, resulting in perfect joints, but makes certain that such stock is obsolutely dry before being laid.

In the glue room the equipment is arranged on a progressive production basis. Two glue spreaders are in operation, each served by a hydraulic press. From the presses extend two overhead carriers which pick up the loaded retaining clamps and deposit them near the specially constructed drying kiln. Here the pieces are unclamped, after standing until the glue has had an opportunity to set, and carefully piled on platforms, such as used with lift trucks. Every care is taken to see that the pieces are piled evenly and that each sticker is placed directly above the one below. This extra attention ensures that the material will leave the kiln true and flat.

Special Provision for Drying

The kiln itself is of the modern type, in which the temperature and humidity are under automatic control, while a strong circulation is secured by means of a blast fan. A temperature of 120 degrees is maintained with a humidity which will bring the moisture content of the stock down to about 5 per cent. While a careful check is kept of all stock coming out, drying schedules have been drawn up covering the different pieces going through. It has been found that these schedules may be relied upon, because conditions in the kiln are always the same, but as an added precaution, as stated above, a check is maintained on the moisture content of the output.

After the stock is removed from the kiln, the usual sizing operations are performed. Where some pieces have been edge-veneered, the edge stock is trimmed flush with the face on a shaper. Straight cutters are set flush with top or guide collar and adjusted to come about 3/16 inch above table. Another collar the same diameter as the guide collar, is placed near the top of the spindle. In trimming, the edge veneer, the stock is held flat against the two collars. The second bearing enables the operator to keep the pieces steady and at right angles to the bed. This is a quick and efficient way of doing this bothersome operation.

Sponge Before Final Sanding

Another departure from ordinary practice as understood in the furniture field is that after the stock has had a thorough preliminary sanding, it is sponged, to raise the grain, and then the sanding is completed on a group of belt sanders. This is far better than where the finisher is called upon to do a lot of heavy sanding after the stain has been applied. While this initial sponging may not eliminate the necessity of a certain amount of sanding in the finishing department, it will make a radical reduction in the time spent in the

phonograph factory where the mouldings for the tops are sponged before being finished on a belt sander.

The secrets of successful veneering, if there are any, are: Have the best possible foundation or core, use good materials and glues, pay strict attention to details and the control and elimination of moisture at all stages of the work. Moisture is at the root of fully 90 per cent. of the troubles encountered in veneering and must be combatted relentlessly and ceaselessly.

Development in Veneering Practice

To-day Attention Centered on Elimination of Moisture and Counteracting Its Effects — Special Care to Drying Before and After Laying

A. S. REDFERN

Probably no one phase of veneering has enjoyed a greater development during recent months than that referring to the elimination of moisture at various stages of the different operations. There is a reason for this and that is that moisture is responsible for more of such troubles as checking, warping, twisting, etc., than any other single factor. Naturally in view of this it is not any wonder that moisture has come in for special attention and that ways and means have been developed for combatting it at every step of the work. One other phase of the work that has been studied closely has to do with strains and stresses in wood. Through a rigid control of moisture and by building panels with opposing layers of similar texture and equal strength, it has been possible to cut down the loss and trouble from warping and cupping.

Practically all movement in veneered or built-up stock, whether warping or checking, occurs when it is either absorbing or giving off moisture. Thus moisture may be said to be, indirectly at least, the cause of the trouble. The word indirectly is used advisedly, for if there were no uneven strains in the various layers which go to make up the completed unit, there would be practically little, if any, tendency to warp, particularly so if the different layers were of the same wood or of wood which expands and shrinks an equal amount. Again, regardless of the strains or stress which may exist in the piece, very little movement will take place as long as the moisture content does not change, especially so if the stock is dry. In the latter event the wood fibre has set in whatever position it happened to be in when dried and will not move until the moisture content undergoes some change, preferably increases. If all panels and veneered work were to be dried to a uniform moisture content and then further manufactured or stored under constant or uniform conditions—conditions which correspond to the standard moisture content adopted—it is not likely that there would be any marked tendency to warp or move, neither would checks develop in succeeding operations.

The two most critical periods in veneering operations, that is as far as moisture is concerned, are immediately before the gluing operation and the subsequent drying operation. Not only must the core be thoroughly dry, but the veneer or cross-banding being applied, must not contain any moisture. Many manufacturers are under the impression that because they purchased dry veneers and cross-banding or becouse they store this material in a dry, warm place, they are not taking any chance in laying their work without paying any attention to the moisture content of the stock to be glued. This is a misguided policy, one fraught with danger. All veneer and cross-banding, particularly face veneers, should be dried immediately before laying. When done thoroughly this has a tendency to eliminate face checks, at least those that are caused by swelling and shrinking.

There are many ways of handling this phase of the work. Some have constructed special hot rooms in which the sock is placed for a certain period. Others have purchased and installed one of the modern types of special dry kilns in which both humidity and temperature are subject to automatic control. These do satisfactory work in every way and are being used on an ever-increasing scale. There is, however, one type of redrier which has been constructed specially for handling veneers and cross-banding. It is known as a hot-plate redrier. The principle is that the veneers are placed between hot plates which are brought together, straightening and drying the veneers at one time. The plates are so actuated that they come together and separate again in a breathing or bellows-like movement. When under pressure the stock is straightened and heated, then when the plates separate momentarily, the vapor formed has a chance to escape and the stock is given an opportunity to shrink. This alternate opening and closing goes on until the stock is dry. If the pressure were to be applied and kept on, the moisture would not be able to escape so readily, and as the stock would be held between two flat surfaces, shrinking would be resisted, with the result that checks would appear. The hot plate type of redrier is in operation in many plants and seems to be the logical equipment for this work.

Regardless of how the veneers and crossbanding may be dried, such stock must be dry at the time of laying. Another point worth mentioning is by having the pieces flat and straight, a better joint results than if cupped and buckled stock were being jointed.

In the gluing operation the pressure should be applied to the work as quickly as possible. By hastening this part of the work, the wood is not given much of an opportunity to swell and the subsequent shrinking, with its tendency to develop checks, is reduced. In the laying operations, speed is a prime requisite.

After the pressure has been released the pieces must be piled for drying. Care must be exercised in this phase of the work, for while it is seemingly unimportant, unless the stock is piled true and flat it will not be true and flat when dried. The humidity controlled type of kiln, referred to above, is an excellent piece of equipment for this work. If the humidity and temperature are under automatic control so much the better for the condition in the piles can be held constant and drying schedules drawn up which may be applied to different kinds of stock.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, CINCINNATI, OHIO.

Mahogany and Walnut Veneers

Veneer department at New Orleans, La., showing 10-ft. Rotary and Clipper and 16-ft. Slicer in rear.

Chicago Offices — M. S. Johnson, 39 W. Adams St.
Toronto — J. R. Kennedy, 50 Front St., E.
Grand Rapids — Geo. A. Baker, Hotel Cody.

THE FREIBERG MAHOGANY CO.

Offices and Warehouses:
CINCINNATI - OHIO

Saw and Veneer Mills:
NEW ORLEANS - LA.

Mahogany Importers and Manufacturers

Western Office, 516 Lumber Exchange, MINNEAPOLIS, MINN. Mills at GLADSTONE, MICHIGAN

The Northwestern Cooperage & Lumber Co., Gladstone, Mich.

THE HOME OF "PEERLESS" STANDARD BRAND PRODUCTS

Manufacturers of

"PEERLESS" ROTARY CUT VENEERS

in Birch, Elm, Basswood, Maple, Ash and Beech for all purposes

Also hoops, liners and staves for manufacture of packages

Also "Peerless" Rock Maple, Beech and Birch flooring; Hemlock lumber; Lath, etc.

"Peerless" products are standard everywhere and you are always exercising Safety First in using them. Try us next time.

(When writing mention Canadian Woodworker)

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SAVE FREIGHT

Rotary Cut Birch and Gum

Why pay freight on gum veneers from southern points when our cutting mill is so near the border.

PANELS

We manufacture Tops, Fronts and Panels of all kinds

Ask for our "Ready to Ship" Stock List

MOHAWK VENEER CO., INC.

Warren, Pa.

Plywood Dept. Warren, Pa.

Cutting Mill Salisbury Center, N.Y.

Litton Veneer Co.

Manufacturers

American Walnut, Figured Gum, Sliced Quartered Oak, and all Kinds of Figured Woods

Walnut and Quartered Oak Lumber

Office and Mill

ROCKFORD - ILLINOIS

J. W. Frye Lumber and Veneer Co.

Dayton - Ohio

Manufacturers and Wholesalers

Specialize in

Walnut Lumber and Veneers

Oak Lumber and Veneers

Also All Native Hardwoods

Guarantee all stocks to be Ohio and Indiana grown

ESTABLISHED-1867 HB INCORPORATED-1904
Reg. U.S. Pat Off.

KNOWLEDGE and honesty are the tap roots to healthy business. Knowledge teaches us to make better goods more cheaply. Honesty will pass that benefit on to others— to you. That knowledge which can create more efficiently and cheaply can produce for the buyer to better advan tage. Hoffman Brothers' hardwoods are traditionally the product of knowledge. For more than a half century we have operated (on one spot) consistently in advance of progress. During each year since the first log was turned the advantage of knowing how to make good lumber at a low cost has been honestly passed on to our customers. Knowledge and honesty are the foundations of our business.

HOFFMAN BROTHERS CO.
FT. WAYNE, INDIANA

·LIVEZEY·

Poplar and Walnut
Veneers

We specialize in large size poplar veneers as we have extra fine poplar logs. We can cut veneer up to 10 feet square.

Our walnut veneer cannot be beat, both in plain and figured wood.

Write us for prices.

Central Veneer Company
Winter Ave. and Belt R. R., INDIANAPOLIS, IND.

Sovemanco
Southern Veneer Manufacturing Co., Inc.
LOUISVILLE, KY.

Importers and Manufacturers of all kinds of Sawed, Sliced and Rotary-cut

VENEERS

CARRYING

a large stock of selected Mahogany, Figured and Plain Walnut, Walnut Butts, Sawed and Sliced Quartered Oak and Sycamore and all other native woods.

1,000,000 Feet
QUARTERED RED GUM
to select from

WE Respectfully solicit your inquiries

C. E. CURTIS & BRO. CO.
2422 S. Western Ave.
CHICAGO, ILL.

SUPPLYING HIGH GRADE
Veneered Panels
IN ANY SIZE, THICKNESS OR KIND OF WOOD

Immediate Shipment on all Stock Sizes in Walnut, Plain Oak, Birch, Mahogany, Etc.

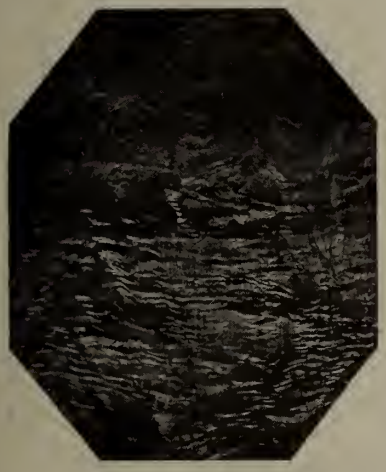
Wide Veneer

One carload of 1/20″
Quartered White Oak
Sawed Veneer
12″ and wider

Ready for Quick Shipment.

Memphis Veneer & Lumber Co.
MEMPHIS, TENN.

The Bachman Plant –and the Bachman Product



A sample of beautifully figured Walnut Stump Wood

Here, in this large and fully equipped plant, Bachman quality veneers are made. Our extensive yards are piled high with carefully selected, choice Indiana White Oak, Walnut and Gum.

Bachman veneers are cut full thickness, which means plenty of wood for sanding and a minimum of breakage in handling.

Bachman's forty years' experience in hardwood sawing is evidenced in every piece of veneer that leaves the plant. The sawed stock can scarcely be told from the sliced.

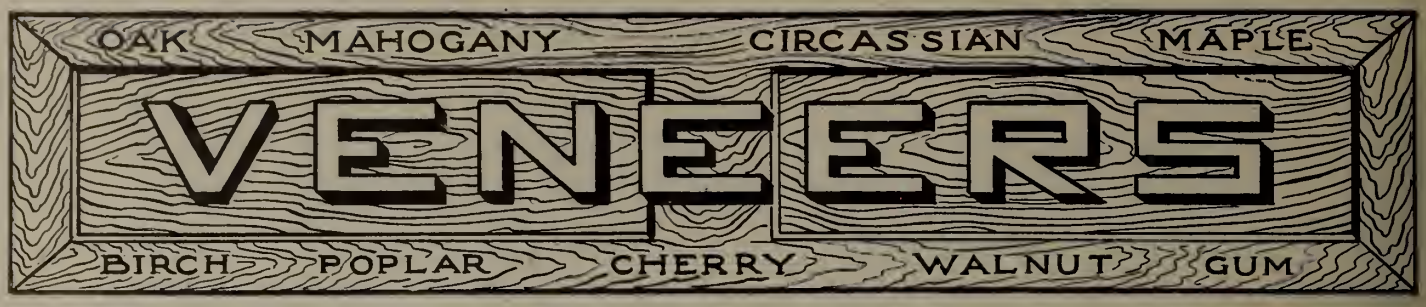
These are a few of the reasons why our customers tell us they get *fifty per cent. more panelling out of Bachman veneers* than they can from average veneers.

It is this unchanging high standard, both as regards materials and workmanship, that has made possible forty years of successful business. It is your assurance of the utmost in quality and service.

No order is too small to receive our prompt and careful attention—none too large to be handled to your entire satisfaction.

F. M. BACHMAN COMPANY

Indianapolis



INVESTIGATE

P.-J. SERVICE

For high-grade rotary cut veneer, that is smooth and evenly cut and dried by mechanical means to any percentage of moisture desired.

We also operate large band mills where all kinds of southern hardwood lumber is cut from our own tract of timber in the very heart of the Saint Francis Basin District, Arkansas.

PENROD-JURDEN COMPANY

A Name that Should be on your Enquiry List for both Veneer and Lumber

Mills at Helena and Penjur, Ark. General Offices: Memphis, Tennessee.

Penrod Walnut and Veneer Co.

KANSAS CITY, MO.

Exclusive Manufacturers American Walnut Lumber and Veneers

AMERICAN BLACK WALNUT LUMBER

FAS—6-9¾" Wide, 8-16" Long

3/8"	3,750 Feet
1/2"	21,470 "
5/8"	44,140 "
3/4"	25,962 "
4/4"	82,502 "
5/4"	26,766 "
6/4"	39,201 "
8/4"	33,140 "
10/4"	14,245 "
12/4"	11,470 "
16/4"	3,700 "

FAS—10" and Up Wide, 8-16" Long

1/2"	9,680 Feet
5/8"	18,980 "
3/4"	14,430 "
4/4"	48,872 "
5/4"	14,165 "
6/4"	10,262 "
8/4"	16,920 "
10/4"	10,250 "
12/4"	1,800 "
16/4"	2,100 "

Fas—6"and Up Wide, 6-7 Feet Long

3/8"	1,200 Feet
1/2"	5,790 "
5/8"	840 "
3/4"	8,940 "
4/4"	32,400 "
5/4"	2,300 "
6/4"	7,800 "
8/4"	1,500 "
10/4"	1,400 "
12/4"	500 "
16/4"	400 "

SELECTS

4/4"	32,940 Feet
5/4"	27,530 "
6/4"	21,480 "
8/4"	33,590 "
10/4"	16,850 "
12/4"	6,054 "
16/4"	1,332 "

NO. 1 COMMON

3/8"	8,000 Feet
1/2"	27,380 "
5/8"	29,850 "
3/4"	31,285 "
4/4"	59,675 "
5/4"	38,240 "
6/4"	18,750 "
8/4"	39,240 "
10/4"	16,363 "
12/4"	4,768 "
16/4"	1,604 "

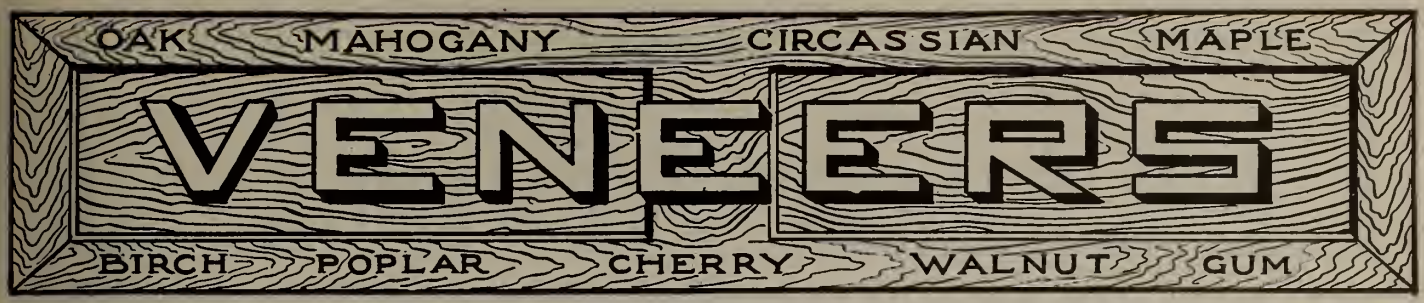
NO. 2 COMMON

3/8"	1,500 Feet
1/2"	1,900 "
5/8"	4,500 "
3/4"	2,190 "
4/4"	72,250 "
5/4"	47,890 "
6/4"	31,720 "
8/4"	35,940 "
10/4"	19,140 "
12/4"	20,116 "
16/4"	16,088 "

Write for prices on any items you are interested in *"PENROD SERVICE" Satisfies*

C. A. Rugg, 115 Foots Avenue, Jamestown, N. Y., Eastern Representative.

Geo. C. Hall, 610 South Michigan St., Representative for Chicago and Michigan territory.



VENEER MANUFACTURERS COMPANY

Announcement!

WE'RE HANDLING PANELS NOW! in addition to our wonderful line of figured and plain Veneer we will handle high grade built-up PANELS!

We take pleasure in announcing the Consolidation of Our Business with that of Mr H. F. ARNEMAN by the terms of which Mr Arneman becomes an officer of The Veneer Manufacturers Comyany

An immense stock of Veneers and Plywood carried in our great Chicago warehouse

Best Quality, Best Service and Fair Prices.

Prompt Shipments

1036 W. 37th. St. Chicago, U. S. A.

QUALITY *SERVICE*

PICKREL VENEER COMPANY, Inc.

MANUFACTURERS OF

American Walnut

Exclusively

Woodruff and River *New Albany, Ind.*

QUALITY VENEERS

in

WALNUT BUTTS - MAHOGANY
LONG WALNUT - OAK - POPLAR
BURLS

CUTTING-ROOM: showing at the extreme far end (very small because of the distance) our huge 17 ft. Slicer; 6 Veneer Lathes ranged along the sides of the room and 4 Power Clippers in the middle space.

Photo by Hughes

MILLS - BALTIMORE, MD.

NEW YORK 709 SIXTH AVE. — Sales — HIGH POINT JAMESTOWN — Branches — CHICAGO 28 E. JACKSON BLVD

THE WILLIAMSON VENEER CO.

VIEWS OF OUR PLANT No. 5.

H.G.W. Del

ALGOMA *the Better* Plywood

"Time will tell"

Your product, built of untested plywood, is "a house built on sand." For plywood is the very foundation of the service your product will give. And failure of the plywood in your product re-acts on your dealer and you.

Time has already given its verdict on Algoma Plywood. For 35 years it has been in use. Today it is being made with the skill and expert knowledge which only years of actual experience can bring.

Why not use the plywood which is uniformly dependable? It costs no more to build for the future as well as the present with Algoma, the Better Plywood. Let us give you the figures on Algoma stock sized panels, which save you money through standardized production. Whatever your needs in plywood, we can supply you.

ALGOMA PANEL COMPANY, *Algoma, Wis.*

Plywood Manufacturers Meet

The Plywood Manufacturers' Association held a general meeting in Chicago on Septemebr 13th and 14th, at which a number of matters of vital interest to the industry were discussed. Thirty-five members were present.

A chart was presented, showing trend of business during the past two and a half years. The average sales per quarter for 1920 were 37 per cent. greater per plant than for 1919, while the first two quarters of 1921 averaged but 19 per cent. per plant of the total amount of business done during the same period in 1920. This gives an indication of the extent to which business has dropped, and reflects to a certain extent the conditions which existed in the furniture and building trades during the first six months of the present year.

The Plywood Glue Committee made an extended report of the new vegetable glue which is being put on the market, and pointed out its economy and all-round satisfaction.

The report of the Publicity Promotion Committee was of exceptional interest, and plans for the advertising campaign, which is to be conducted jointly with the National Association of Veneer and Panel Manufacturers, are about complete, and it is expected that active publicity work will be undertaken in the near future. The Mahogany Manufacturers and Importers' Association and the Walnut Manufacturers' Association have pledged their co-operation in this advertising movement.

Suggestions for Brazing Band Saws

While brazing band saw blades is a comparatively simple operation, there are some who experience considerable difficulty in securing uniformly satisfactory results. The following suggestions will, if followed carefully, assist in overcoming much of the trouble experienced in performing this operation:

First of all, the irons for heating should be as thick as the machine will allow—that is, the space or opening between the base and the pressure clamp. Then the irons need to have a good plane surface—actually they should be machined quite true on their faces—be free from burrs, twists or distortion, so that they shall have a perfectly true bearing on the saw joint. Further, the irons should always be brought to a very bright red heat, a mistake too often made being that the irons are insufficiently hot at the start of the job.

Then before placing the plates in the machine, or the saw between them, get an old rough, flat file and remove every particle of loose scale from the abutting faces, so that when they are clamped upon the saw blade they shall bear truly and intimately upon the joint, so as to ensure no possible chance of inaccuracy.

Leave the saw in the plates until the latter become black hot (not forgetting to relieve the tension in the saw by easing back thec lamping screws), then slacken off the cramps, take away the plates, and allow the saw to cool down.

Were these instructions followed out more closely than usually they are done, there would be fewer disclaimers to the superiority of plate brazing.

Safety first does not mean that the machine should be so covered that it is almost impossible for the man to work it.

Leather belting has its own peculiar advantages. Balata answers exceedingly well for most drives, but each and all are ruined if they have to transmit extra heavy loads.

One advantage with ball bearings is that they do not want tinkering with every few months to make the spindle run dead true.

When sharpening a wide panel planer it is advisable to use two kinds of stones; a coarse grade to bring the edge up quickly and a very fine grade to get a very keen edge.

MAINE BIRCH VENEERS

THE BEST IN THE WORLD

The Standard Veneer Co.
Portland, Maine

WE HAVE A COMPLETE STOCK OF 3 and 5 PLY PANELS IN VARIOUS WOODS AND THICKNESSES FOR QUICK SHIPMENT
Also offer 3/8" 3 ply Fir s-2-s Panels for Drawer Bottoms and Backing.
1/8" Rotary Cut Northern Red Oak
1/8" Rotary Cut Northern White Oak.
1/8" Birch Veneer 6 to 36" wide 60 to 86" long.
Panels also made to your dimensions.
Write for Prices
GEO. L. WAETJEN & CO.
Milwaukee - Wisconsin

100% EXCELLENCE
Manufacturing
High Grade ROTARY CUT VENEERS
Specializing BIRCH DOOR STOCK,
MAPLE PIANO PIN BLOCK STOCK
Years of Experience Behind Our Products
The Munising Woodenware Co.
MUNISING, MICH.

Hardwoods Made to Help Cut Your Manufacturing Cost

Your raw material is a big factor in woodworking costs. With your lumber and veneer it may have better texture and uniform color, saving in working and matching. It may be better cured by superior air drying (in lumber), or careful kiln drying with obvious saving. That is exactly the service we are pleased to offer you—a big organization built through thirty years' work around the factory man's needs. For instance, our twenty trained timber men carefully pick for uniform quality all the logs we cut; we have seven separate plants, each built to cut only a certain product, making uniform quality positive. Our lumber and veneer drying facilities are the result of rigid tests and exhaustive study and extensive enough for **any** demand.

As a result our lumber and veneer are recognized for their cost-cutting qualities. Have you tried them?

Wood - Mosaic Company

INCORPORATED

LOUISVILLE, KENTUCKY.

Chicago Representative:

GEO. W. STONEMAN & CO. 845 West Erie St.

Grand Rapids Representative:

HECTOR ROBERTSON 232 Lyon St. N. W.

Plywood Advertising Campaign

In their search for material on which to prepare copy for the forthcoming $50,000 advertising campaign to be conducted in favor of veneers and plywood, those in charge of this campaign have left no stone unturned. They have succeeded in unearthing many fine old pieces of furniture built centuries ago which owe a goodly portion of their attractiveness and certainly owe their longevity to the fact that they were constructed of veneers. Among these pieces are numbered some of the priceless old heirlooms and antiques which have been handed down from generation to generation for centuries and which now repose in many of the noted public and private collections.

The study of thes fine old examples of the cabinet-maker's art has brought to light the fact that many of the old masters such as Sheraton, Shearer, Adam, Hepplewhite and others, used veneer on an extensive scale. As these pieces were produced at a time when quality was th greatest consideration, it cannot even be suggested that veneers were used in an endeavor to lower construction costs. More than that, these old masters realized that it cost more to complete a cabinet in veneers than had the same piece been made from solid wood. Sheraton has this to say wth regard to the use of veneers: "The ground, glue and extra time required for the vener work are more than equivalent to the extra high cost of fine woods in solid pieces." Another writer, commenting upon the use of veneering, says: "By the veneering principle alone can the burrs of walnut and mahogany and the curls of satinwood and other similar species be shown. The same is true of the burrs in amboyna and walnut. These twist and fracture in the solid piece and are lost. Veneers alone could have preserved these classic specimens."

One purpose of this campaign wil be to convince the general public that veneer or veneering is a fine art of the highest order and was recognized and practiced, not only by the master craftsmen of the English periods but by the old cabinet-makers of the Renaissance and French periods. As proof of this contention, they propose illustrating many of these old veneered pieces which have stood the test of time to such a remarkable degree.

It might be an interesting feature of a campaign of this kind, if it were possible to show side by side, say, 15th Century pieces in both veneered and solid wood. If that were possible, it is likely that the veneered pieces would be intact, while those constructed from the solid material would be found to be checked, warped and twisted so badly as to be rendered practically useless.

There are two strong arguments which may be used in favor of veneered products. One is as suggested above, the fact that in no other way can the beauty of some of the rare old burls be preserved and used on furniture, and the other is the fact that owing to the method of construction followed in building up veneered work, with its cross-banding and crossed grains, the veneered article is capable of resisting the tendency to check and warp which is so strongly exhibited by solid material.

Nor has the scientific side of veneering and veneered products been overlooked in favor of the historical. The material assembled for this campaign presents a most thorough and scientific treatment of the subject, together with a realization of the importance of extended research work as a basis for advertising propaganda of this character. This campaign should mean much in an educational way, not only for the manufacturers and users of veneers, but for the public in general in their appreciation of the product of this art in bringing their homes in line with the Better Furniture for Better Homes Movement.

Is Prosperity Just Ahead?

By M. WULPI

The situation business has passed through the past ten months is not to be wondered at, when it is realized that the war upset conditions of every kind, and carried its detrimental effect into every phase of human life and activity. The one big wonder is, that we seemingly are getting out from under it so rapidly. It took the country eight years to recover from the civil war, which was not nearly as far-reaching as the late one. The big commercial question at this time is, "What is this fall going to see?" Naturally, the buying activity and power of the farmer is as big a factor in the answer as any other. The 1921 crop is big. There are almost six and a half million American farms. Will they buy this fall, and to what extent?

A farm journal publishing house recently issued an inquiry to 12,824 farmer "Smiths" on its 1,100,000 subscription list, as a fair representation for general results. The question was: "What would they do with this harvests cash?" The returns were heavy. Computing the percentage in returns, the following deductions were made:

Of the total 1,100,000 farmers—
513,700 will paint this or next year.
42,900 will build houses this year.
38,500 will build next year.
40,700 are planning to build barns.
15,500 are planning to build houses and barns.
786,500 buildings to be built.
191,670 buildings repaired or remodeled.
862,000 farm building built, repaired or remodeled.
521,400 build or repair fences this fall.
95,800 build or repair fences next year.

11 5/10 of the Smiths will buy autos this fall, making 126,500 autos to be purchased by the 1,100,000 farmers, 137,000 already decided upon as to makes for this year and next.

They are to purchase 17,600 motor trucks this fall and 2,100 next year.
8,300 motorcycles this year.
68,500 will purchase lighting plants.
33,100 will install heat plants.
28,800 gas engines to be purchased.
78,100 washing machines.
120,300 musical instruments.
33,100 tractors.
100,000 implements.

$911,503,000 estimated total purchases by the 1,100,000 on this journal's list.

When it is considered that this is but one-sixth of the total farms and refers to only the main items, the total cash to be expended will run into cast sums from this medium alone.

How many other whcels will this put into motion? One industry interlocks into another, and if all move, what a tremendous machine it is. Let but a few cogs stop and the effect is far-reaching, and to the reverse, let one start off well, how many others it will drive.

Toronto Veneer Company Ltd.

(Operating Panels, Limited, Southampton, Ont.)

Office and Veneer Warehouse:
1100-1104 Queen St. West
Toronto

Lumber Yard:
Atlantic Ave. and G.T.R. tracks
Toronto

Veneers, Panels, Tops

Large stocks of Veneers and Panels carried at Toronto—Special Panel Orders promptly filled by Southampton factory.

Rim-bound Dining Room Extension Table Tops—5-ply, 42 in.-60 in., in Birch, Plain and Quartered Oak, Mahogany and Walnut—sanded and moulded—3-ply and 4-ply bent table rims—36 in.-51 in., in Birch, Plain and Quartered Oak, Mahogany and Walnut.

Our special Rim-Bound Construction, and use only of the best care stock, Crossbanding and Face Veneers—produces a Very Superior Top—a Top which will "sell" your Tables.

LUMBER

We are constantly shipping direct from mills to our Customers—Mahogany—Walnut, Oak, Yellow Poplar—White Ash, etc. from Indiana; Gum, Cypress and Yellow Pine from Mississipi; and Chestnut from North Carolina.

Toronto stocks include Plain and Quartered White and Red Oak, Cherry and Butternut, and we have Yellow Poplar, Mahogany, Walnut, in transit, Oak, Mahogany, Walnut and Gum.

We especially want to sell, several cars, 4/4 to 8/4 Sound Wormy Chestnut, several cars dry white Oak dimension—2 in.×2 in., 2 in.×3 in., 2¼ in.×2¼ in., 2¼ in.×2½ in., 2½ in.×5 in., 2½ in.×5½ in., 3 in. ×5 in., and 4¼ in.×4½ in.,—1 ft. to 8 ft., Clear and No. 1 common—Quick delivery on this.

INQUIRES SOLICITED

Fair Prices - Good Service - Courteous Treatment

Baseball Team of the North Americans, Bent Ceair Co., Limited, Champions Junior City League

N.A.B.C. Co. Team Wins Championship

The baseball team of the North American Bent Chair Co., Owen Sound, won the pennant of the Senior City Baseball League for 1921. Last year the team of the North American Furniture Co., Limited, took first honors.

As a reward for the showing made, the boys were given an outing in the shape of a tour of Manitoulin Island and north to Sault Ste. Marie. While on this trip a number of exhibition games were played at some of the stops. The party, which numbered about twenty, was chaperoned by John G. Hay, president of the North American Bent Chair Co., and Mrs. Hay. Gordon McIntosh, secretary-treasurer of the North Amerisan Bent Chair Company's club, and R. Fletcher, another official of the same organization, accompanied the boys.

The accompanying illustration shows the team, together with the officers of the club. The names of those comprising the group are as follows: Top row, left to right—Fletcher, C. Whinfield, Scott, Vasey, Wilson, Keeling, McIntosh. Second are, left to right—Patterson, Kinch, A. Whinfield, Rae, Garbutt, Foote, Hay. Bottom row, left to right—Greenaway, Robertson and Matchett. Insets show J. G. Hay, president, and James Garvie, secretary of the North American Bent Chair Co., Limited.

Special Furniture for House of Commons

The contracts for furniture for a number of rooms in the new Parliament Buildings at Ottawa, which were awarded recently, were divided between the following firms: H. Krug Furniture Co., Limited, Kitchener, Ont.; Preston Furniture Co., Limited, Preston, Ont.; Castle & Son, Montreal; Broomsgrove Guild of Canada, Limited, Montreal; Henry Morgan & Co., Limited, Montreal; J. A. Ogilvie, Limited, Montreal; F. E. Coombe Furniture Co., Kincardine, Ont.; Interior Hardwood Co., Kitchener, Ont.; R. A. Sproule & Son, Ottawa, and the Owen Sound Chair Co., Owen Sound, Ont. The main portion of the order went to the first three firms.

The furniture, which is being made from special designs prepared by the Government architect, is all in black walnut. It is to be of the highest class, the specifications being very strict, and calling for the maintenance of the furniture for twelve months after delivery. The total estimated value of the order is between $160,000 and $180,000.

The furniture consists principally of chairs, desks, couches, settees, tables, stands and racks, for the Governor-General's, Prime Minister's and Speaker of the Senate rooms; committee rooms, dining rooms, reading rooms, waiting and secretary's rooms. A very large number of chairs are required, including easy chairs and chairs with and without arms. Couches to the number of 150 are ordered for the members' rooms; tables in three designs for the Commons' reading room, eight desks for Ministers, a large number of tables for committee rooms, 15 square tables and 15 folding tables; extension tables and sideboards for private dining rooms, together with a quantity of settees, hat and coat stands, newspaper racks and screens.

Some of the furniture is of a specially high order. For instance, that for the Governor-General, Prime Minister and Speaker of the Senate. The furniture for the Governor-General's room will consist of two desks, a large cabinet, a Mace cabinet, six arm and eleven easy chalrs, and three sofas, whilst that for the Prime Minister's room will consist of two bookcases, two large tables, two side tables, two sofas, four easy chairs, twelve armchairs and twelve small chairs.

Stock of Veneers Partially Destroyed

Part of the stock of the Astoria Mahogany Co., Inc., Long Island City, N.Y., was recently destroyed by fire. The blaze did not reach the sawmill nor veneer manufacturing plant, but was confined to one of their several veneer warehouses. As a consequence only a small proportion of their veneerd stock was destroyed, probably not exceeding 3,000,000 feet of mahogany. Circassian walnut and other veneers. This will not interfere with their business in the least.

Walnut, Quartered White Oak and Mahogany Veneers and Lumber

Prompt Delivery

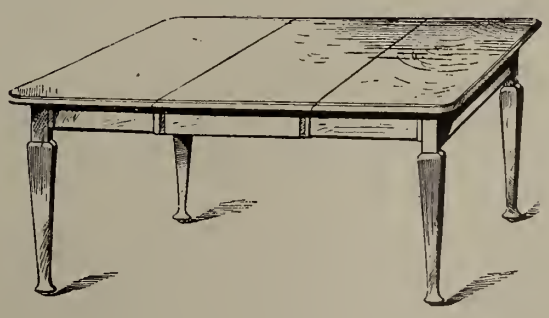
LONG-KNIGHT LUMBER COMPANY
INDIANAPOLIS, IND.

VENEERED TABLE TOPS

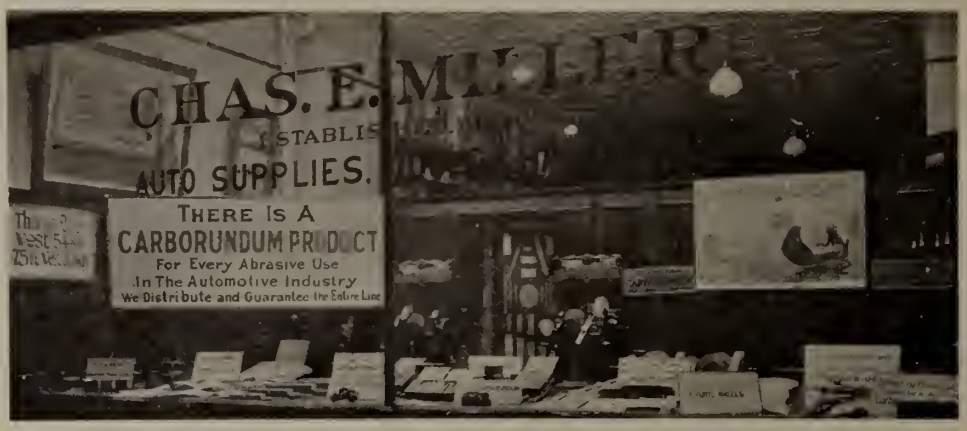
WALNUT - MAHOGANY - QUARTERED OAK

PROMPT delivery in any quantity at very attractive prices. Just let us know your requirements and we shall be glad to forward quotations.

Panels are made in Walnut, Quarter Oak, Birch, etc. Large sizes (72x24; 60x30; 60x24; 56x25; 60x20; 60x18; 48x18) carried in stock at all times.



HAY & CO., Limited Woodstock, Ont.



A Variety of Carborundum Products

A very interesting display of Carborundum products is to be found in the window shown in the accompanying illustration. Practically all the articles on display are made from either this material or Aloxite, another abrasive of a similar nature. Both are products of the electric furnace and are admirably adapted for use as abrasives.

Carborundum is made from mixing such ordinary materials as coke, sand, sawdust and salt and fusing them together at the almost unbelievable heat of 6,000 degrees F. If memory serves the writer correctly, this is about the temperature of the surface of our sun as worked out and calculated by scientists. Whether that is correct or not, this is some heat. After being subjected to this intense heat for 36 hours, we find that these compounds have been fused into an extremely hard material which has been called carborundum. In hardness it rivals the diamond, being the second hardest substance known to man. It will be seen that as an abrasive material it should be difficult to equal.

Included among the articles shown are carborundum sharpening stones and grinding wheels, carborundum grinders, carborundum grinding powders and carborundum papers and cloths. All this display merely tends to indicate the wide diversity of Carborundum products and to give an outline of the wide number of uses to which this abrasive material has been put.

Conditions in Millwork Industry

A good idea of conditions in the millwork field may be gathered from the following letter which was sent in by the manager of one of the larger woodworking plants:

"There has been a decided improvement in the millwork industry during the past two months. Considerable building of medium class is in progress, creating a demand for sash, doors and interior trim. All work, however, has been thus far strenuously contended for and prevailing prices allow only a meagre, if any, margin of profit. This is deplorable in view of the fact that there is enough business available to keep all local plants moderately busy. There has been almost a frantic stampede to obtain business at any price, the natural result being that values are being forced to a very low level. When we consider that the lumber and millwork industry have already reduced prices far and away below any other branch of the building trade, one is led to wonder why the undue haste to sell near or below cost. The answer is, only a few of us know what our products are costing; the rest of us are simply guessing instead of intelligently and scientifically estimating. With these conditions improved, and armed with a knowledge of our costs, we would be in shape to handle the tremendous volume of business that is even now showing indications of an early arrival. Continue to preach the doctrine of "Cost Keeping" through the medium of your splendid journal. It will prevent many sash and door factories from closing their doors.

"If vendors of other commodities which go to make up the finished building, together with labor, adopt the same attitude as the millwork industry, the year 1922 will be without precedent."

Saw to Produce Excelsior Instead of Dust

According to a recent report, a company in the United States is considering bringing out a resaw for box makers that will produce excelsior instead of sawdust. This is in line with the widespread movement for greater utilization of wood waste. About the only way to make a saw produce anything resembling excelsior, appears to be, to have the material fed through on end so that the saw cuts lengthwise of the grain. No doubt some such arrangement is being incorporated in this new saw. Naturally a scheme of this kind has very narrow limitations, for it would not be practical to construct a saw that would cut long lengths of lumber, standing on end. Where some such scheme is applicable it should open up new source of revenue, for there is an almost universal demand for excelsior or wood wool.

Starting a Building Co-operative Scheme

A New York state furniture dealer has offered a plan to solve the building and unemployment problems. He proposed that twenty persons put up $100 each, starting it himself. Then the Chamber of Commerce was to put up a similar amount. Material, men and labor were invited to join. Those who put up the money took stock for the amount they gave. The proposal is that materal men should provide material, and take half cash, and the balance in stock of the company. It is further proposed that workmen should take half pay and the balance in stock in the company, which would own the buildings to be erected.

WHAT about your future hardwoods? It is obviously no time to preach Lumber "shortage" and we have no such porpose. But it is true that practically no lumber is being made and present shipments are slowly, but surely, wearing down stocks. It is only a question of time when there will be nothing left but a broken lot of low grade for there is no physical possibility of measurably increasing production for many months.

Now comes the easing of the cotton situation—releasing the money with which to carry present mill stocks. Our judgment is by no means infallible, but doesn't it look to you as though these circumstances would make it a logical time to buy at least a moderate stock? We have further information that would be of vital interest to any lumber buyer who will address us.

ANDERSON-TULLY COMPANY

MEMPHIS TENNESSEE

News of the Trade

G. R. Stevens has been appointed Canadian Trade Commissioner with headquarters in Jamaica.

English & Williams, Owen Sound, Ont., have opened up an upholstering and furniture repair shop.

The Standard Planing Mills, North Bay, Ont., contemplate installing a shingle mill. George Ingram is manager of this company.

The Pacific Color Mfg. Co., Limited, have secured a site at Chilliwack, B.C., and will erect a plant for manufacturing colors for paints, dyes, stains, etc.

An order has been placed with the Fort William Car & Foundry Co., Fort William, Ont. for repairing 1500 cars for the Canadian National Railways.

Jacob Malloy, of the firm of Malloy & Bryans, manufacturers of staves, headings, hoops and other cooperage stock, died recently at his home in Toronto.

The J. B. Watson Furniture Co., Limited, Kincardine, Ont., manufacturers of wicker furniture, contemplate erecting an addition to their factory.

The Western Lumber Retail Dealers' Association have voted $25,000. to be spent in an advertising campaign intended to stimulate building in various lines.

The Nelson Match Co., Limited, Nelson, B. C. recently placed an order for half a million feet of selected white pine, suitable for their product.

F. Huffman, formerly connected with the Badger Wood Products Co., Shawano, Wisconsin, has joined the staff of the Wood Turning Products, Limited, Deseronto, Ont.

The Canadian Gary Motor Truck Corporation, who are establishing a plant in Toronto, have decided to erect an assembling plant at Fort William from which to handle their Western Canada business.

Sorel Lock, Limited, Sorel, P.Q., have been incorporated to manufacture and deal in boats and launches of all kinds; capital $20,000. J. E. Pare and J. L. A. Deguise are two of the incorporators.

James Maxwell, president of Maxwell's Limited, St. Marys, Ont., manufacturers of agricultural implements, passed away at his home in that city. Mr. Maxwell was in his sixty-fourth year.

Major J. E. L. Streight, who formerly operated a planing mill and lumber yard at Islington, Ont., is the Liberal candidate for West York in the forthcoming federal election.

According to a report by J. E. Ray, Canadian Trade Commissioner, of Manchester, England, there is a good demand in Great Britain for toys in the shape of animals on wheels having a rigid iron frame and well-finished wheels.

The General Motors Corporation have decided to concentrate the manufacture of all its export models, with the exception of the Cadillac and General Motors Truck, at the Canadian plant of the corporation, known as "The General Motors, Limited," at Oshawa, Ont.

The Ottawa Stair Works, Limited, Ottawa, Ont., have been incorporated to manufacture and deal in woodwork of all kinds, and to take over as a going concern the partenership now known as the "Ottawa Stair Works." Capital $100,000.

Robert Stewart, Limited, Guelph, Ont., recently commenced work on a new planing mill and sash and door factory to replace the one which was destroyed by fire. The new factory will be two storeys, 110 feet by 152 feet, and of solid brick construction. In addition to the factory, they are erecting a dry kiln, office and large warehouse.

The Bissell-Irwin Lumber Co., Sherbrooks, P. Q., have taken over the lumber yard and woodworking plant of the Fletcher Corporation, Limited. In addition to the regular lines of building material, boxes, shooks and crates will be produced in the new plant.

The Board of Education of London, Ont., is investigating the cost and suitability of portable schools to take care of any overcrowding which may exist. The Board is also interested in prices on seating and other equipment for these temporary structures.

The British Columbia Export Club was recently formed with the object of developing British Columbia's overseas trade. The membership numbers about seventy-five, representing practically all the leading industries of Vancouver and the lower mainland.

Gordon C. Edwards, for many years manager and a director of the W. C. Edwards & Co., Limited, Ottawa, woodworkers and lumbermen, was recently elected to the Board of Directors of the Canada Cement Co., Limited, Montreal.

The McFarlane Mfg. Co., Limited, were recently granted a charter to manufacture and deal in woodenware and wood products; capital $100,000. This new organization will take over as a going concern the business now known as the McFarlane Mfg. Co.

Waltham Motors Corporation of Canada, with head office at 9 Wellington St. Toronto, have completed arrangements for taking over the plant of the Barrie Carriage Co., Barrie, Ont., where they propose manufacturing their line of trucks.

The Ingle Planing Mill, Lindsay, Ont., have branched out and are making a line of specialties in the shape of hall trees, floor lamps, paper stands and other pieces of a similar nature. They find that there is a strong demand for this new line.

The Tilt-Lok Steering Wheels, Limited, were recently incorporated to manufacture and deal in automobile parts and accessories; capital $200,000. John A. Campbell and H. E. Manning, barristers-at-law, Toronto, are given as two of the incorporators.

The E. W. Tickle Lumber Co., Liverpool, England, who deal largely in mahogany, report that the recent sales of this wood have been well attended and the bidding has been keen. At one of the latest sales held the prices were somewhat firmer than those which have been prevailing in that market.

The Sterling Woodworking Co., Limited, St. Lambert, P. Q., have been incorporated to carry on a general woodworking business, and to manufacture furniture, pianos and wooden articles of all kinds; capital $99,000. R. T. Stackhouse, K. C., and John McNaughton, both of Montreal, are among the prov-

The I. X. L. Mfg. Co., Harriston, Ont., have received a contract to manufacture 6000 car doors for the Paget Car Co-operative Co. of Buffalo. These doors will be used by U. S. railroads in carrying grain out of Buffalo. A staff of about forty men is busy on this order.

The Standard Dry Kiln Co. of Indianapolis, Ind., have recently issued a catalogue covering their line of kilns and equipment. Practical information is included on planning the layout of dry kilns and yards

Do you know what percentage of the selling price is represented by Labor Costs?

Labor enters largely into your production costs, and in order to establish a fair selling price for your product you must know exactly what these labor costs amount to.

Ask yourself the question again—"What percentage of the selling price is represented by labor costs?" It is too important to pass by lightly. If you are using accurate and unchangeable printed labor time records as obtained by the use of International Job Time Recorders, you can answer the question without any difficulty—you can even answer it on any finished product or portion of that finished product which is turned out by your factory. It is at your fingers' ends whenever you require it.

INTERNATIONAL TIME RECORDERS are as indispensable to the purchase and distribution of your Labor Time as the Board Measure is to the purchase of your raw material, or the sale of your product.

Let us send you full particulars about this money-saving system. Our advice is free!

International Business Machines
SPEED ACCURACY ECONOMY

International Business Machines Co.
LIMITED

F. E. MUTTON, Vice-President and General Manager

Head Office and Factory: 300-350 Campbell Avenue, Toronto

HALIFAX, 44 Granville St. ST. JOHN, 29 Dock St. QUEBEC, 506 Merger Bldg. MONTREAL, 1 and 3 Notre Dame St. OTTAWA, 190 Queen St. TORONTO, 409½ Yonge St. HAMILTON, Room 8, 36 James St. S. LONDON, 489 Richmond St. WALKERVILLE, 44 Lincoln Rd. WINNIPEG, 227 McDermott Ave. VANCOUVER, 230 Cambie St. SASKATOON, 254 Third Ave. S.

Also manufacturers of International Dayton Scales and International Electric Tabulators

and many suggestions for reducing handling costs in the lumber yard are given. The equipment described includes door carriers, lumber lifts, turn tables, trucks, transfer cars, steam traps, recording hermometers, hygrometers, testing apparatus and other similar instruments.

P. W. Gardiner & Son, Limited, Galt, Ont, manufacturers of doors and building material, are erecting an addition to their factory, 90 feet x 112 feet. This is to be used as a warehouse. They are also contemplating adding some new equipment to their sash and door factory some time next year.

The National Cooperage Co., Hastings, Ont., have taken over what is known as the Radiator building. It is the intention of this firm to construct and equip a sawmill, stave factory, dry kiln and storage plant. It is expected that employment will be given to from forty to fifty men in addition to a number of men in the bush.

R. E. Truax of Walkerton, Ont., was recently nominated by the Liberals of South Bruce to contest that riding in the forthcoming general electons. Mr. Truax, who is known as the proprietor of a busy sash and door factory and planing mill, recently celebrated his 74th birthday.

The ratepayers of Trenton, Ont. have passed a by-law granting a bonus of $25,000. together with free site and a fixed assessment to the Anglo-American Auto Co., Royal Bank Building, Toronto. This organization proposes to establish a $500,000. motor industry in Trenton.

C. B. Williams & Co., Limited, Toronto, Ont., were recently granted a charter to conduct a planing mill and to manufacture wood products of all kinds; capital $40,000. This new organization will supersede the C. B. Williams Co., who have conducted a general woodworking and retail lumber business in Toronto for many years.

The Massey-Harris Co. of Toronto, have decided to open a branch factory in Australia to take care of their Australian trade. This new move is due to the fact that the tariff recently imposed by the Australian government has practically closed the ports of the Commonwealth against agricultural implements other than those produced by local manufacturers.

According to the statement recently issued by Carriage Factories, Limited, Orillia, the past twelve months have been unusually trying. A deficit of $157,000. is recorded for their current year which ended July 31st. This is made up of an operating loss of $93,000. and a reduction in inventories of $55,000. Last year the deficit was $36,000.

The Canadian Founders & Metal Trades Association recently sent out a wage scale to their members with the suggestion that they apply it to their pay roll. Under this schedule wood pattern makers are to receive from 55 cents to 65 cents an hour, while carpenters are listed at from 45 to 55 cents per hour. Forty-eight hours to constitute a working week.

The National Cooperage Co., Windsor, Ont., who recently secured a site and buildings for the purpose of manufacturing cooperage lines, are installing some special automic machines, one of which is capable of turning out seven completed barrels a minute. This company plan to manufacture barrels and similar lines on a large scale and are establishing plants at a number of strategic points. The Welland plant is the third to be put in operation. The personnel of this company is as follows:- Mr. Lickley, president and W. J. Bragg, M.P.P., Bowmanville; Harry Buck, Norwood; Dr. Hess, Hastings, Ont. and B. J. McCormick, Welland, directors.

Wallace, Barnes & Co., Limited, a Canadian branch of the Wallace, Barnes & Co., Limited, Bristol, Conn., have taken over a plant in Hamilton, Ont., to manufacture screw machine products and springs of all kinds. This company is capitalized at $300.000. and will give employment to one hundred and fifty men.

The Garlock-Walker Machinery Co., Limited, Toronto, have moved their offices from 32 Front St., to 163 Dufferin St. This move should work out to the convenience of their many friends, for the offices and warehouse are now housed in the one building, enabling them to show prospective customers their complete stock of machinery and equipment.

The planing mill of Rankin & Co., Toronto, was recently damaged by fire to the extent of $20,000. Spontaneous combustion in shavings chute is given as the cause of the fire. The planing mill, which was of two-storey brick structure, was completely gutted while the excelsior plant was only slightly damaged. Johnson & Sons, Toronto, pattern makers, who occupied part of the same building, suffered a loss to machinery and stock of $10,000.

The Hoard Co., Port Alberni, B. C., was recently organized to manufacture silos of a new type. This silo is eight-sided and no bolts or iron bands are used in its construction, the planks being dovetailed into each other. The manufacturers claim that it will not be affected by swelling or shrinking. Equipment has been installed to manufacture 1500 silos per year. It is anticipated that the output will find a sale in Canada, Australia, New Zealand and the United States.

The Provincial Machine & Supply Co., Limited, St. Thomas, Ont., who have been manufacturing phonograph motors of different kinds, are now turning out a completed instrument. The cabinets are being constructed by the Green Lumber Co. of St. Thomas, while the metal parts are all manufactured in the plant of the Provincial Machine & Supply Co. It is stated this phonograph will compare favorably with any on the market both as regards appearance and tone quality. This new instrument will be marketed under the name of "Sonograph."

Cranbrook Sash & Door Co. have decided to rebuild their Cranbrook planing mill and sash and door factory, which was destroyed some years ago. Their plans call for a new building 60 x 110 feet, two storeys high, equipped with all the machines required for the production of a general line of building material and sash and doors. They recently acquired the Henderson sash and door plant at Golden, B. C., and are bringing the greater part of the equipment from this plant to Cranbrook for their newest factory. It is expected that employment will be given to between forty and fifty men as soon as the new plant is put in operation.

The business of the Veneer Manufacturers Co., 1036 West 36th St., Chicago, has been amalgamated with that of H. F. Arneman of the same city. By this merger Mr. Arneman becomes an officer of the Veneer Manufacturers Co. and will take an active part with Messrs. H. F. Walsh, S. J. Glanton and S. D. Rowe in the management of the business. Mr. Arneman brings to this company a wealth of experience in the veneer and plywood industry, which should be of service to the trade. In addition to plain and figured

One Reason why Kraetzer Cured Gum is Straight and Flat

Ask Your Factory Superintendents

You dont have to take our word for it ask your factory superintendent.

What? Why, how much stained or doty gum you are getting and what it is costing in waste, expense of removing and replacing unsound pieces put into work in the hope of "getting by" and minimizing waste, only to have it fail to pass inspection.

Do you know what stain is? It is what a headache is to you. A headache is only a warning of some derangement of one or other of the organs. Stain in lumber is only the visual evidence that decomposition has started within. How long did you suffer and "cuss" with headaches until you heeded the warning and had your eyes fitted with glasses?

Remember how beautiful the world became all at once

In just that manner, your worries cease and problems of production become simple when you heed Nature's warning and use GUM that is BRIGHT.

Of course, you can get Gum in this condition - at least, you can from us. We guarantee our KRAETZER-CURED Gum to be FLAT, STRAIGHT, and BRIGHT. Know it by the brand.

Your Protection

THE KRAETZER-CURED LUMBER CO.

Our Guarantee

The Kraetzer-Cured Lumber Co.

GENERAL OFFICE: GREENWOOD, MISS.

Band Mills: Greenwood, Miss., Moorhead, Miss.

veneers, a large and well-selected stock of plywood panels will be carried in the Chicago warehouse.

The Rice Lake Canoe Co., Limited, Cobourg, Ont., has been authorized by supplementary letters patent to increase their capital from $100,000. to $150,000.

The Flexible Lacing Co., Chicago, manufacturers of the well-known Alligator Steel Belt Lacing, have issued a partical little booklet called "Short Cuts to Power Transmission." This book contains a considerable amount of practical information pertaining to the use of belts, including tables and other information of a more or less technical nature.

The R. Laidlaw Lumber Co., of Toronto, are adding some new equipment to their Dundas St. woodworking plant. The order has been placed with the A. R. Williams Machinery Co. and calls for the following machines:—Yates C 3 Moulder; Yates 108 Moulder; Preston Veneer Jointer; Peston Power Feed Rip Saw; C. M. C. Power Feed Rip Saw; Cowan Belt Sander; Cowan Jig Saw, and a special Trim Saw.

The first large passenger ship to be built in British Columbia was recently launched from the yards of the Wallace Shipyards Limited, North Vancouver, B. C. This vessel, which is known as the SS "Princess Louise," was constructed for the C. P. R. fleet. There is stateroom accomodation for three hundred passengers, while the dining room will seat one hundred and forty people. A separate second-class dining and smoking room has been provided. All the woodwork required for this vessel was fabricated in the woodworking plant of the Wallace Shipyards.

The Everett Mfg. Co., Limited, Sault Ste Marie, Ont., was recently incorporated with a capitalization of $100,000., for the purpose of manufacturing ironing tables, clothes dryers, step-ladders and other household woodenware. A. E. Stewart is the president of the company, C. D. Everett, vice-president and general manager, James Lyons, treasurer and P. T. Rowland, secretary. The other director consist of F. J. Buchanan, James Shaw and W. E. S. Bryan, all of Sault Ste Marie. The company expects to be operating by about the middle of November, and the object is to market woodenware throughout the world.

The Angus-Keefer Lumber Co. of Belleville, which was recently incorporated, have taken over the plant formerly owned and operated by the Thompson Furniture Co., Limited. The company are running a retail lumber yard and general woodworking factory, but do not contemplate manufacturing furniture until some time next year. The company have sufficient work in hand to employ fifty men the biggest part of the coming winter. The plant of the company is located at 111 Station St., Belleville. J. E. Angus is the president and manager of the new concern, and N. Keefer, secretary-treasurer.

Wood Specialties, 410 Parthenais St., Montreal, P. Q., is the name of a company which has been organized recently to manufacture and deal in wood products of various kinds. One of the chief items to be manufactured is spruce sounding boards for pianos. This is a move in the right direction and one that should be welcomed by the piano trade. Heretofore practically all the sounding boards entering into the manufacture of Canadian pianos have been brought in from the States. Now that this item, too, is being made in Canada, it is to be hoped that Canadian piano men will show an inclination to patronize home industry.

An Ottawa report states that contracts have been placed with a number of Canadian furniture manufacturers for furniture for the reading room, member's quarters, etc., in the new Parliament Buildings. The following firms were among the successful tenderers: Owen Sound Chair Co., Owen Sound; R. A. Sproule & Son, Ottawa; Interior Hardwood Co., Kitchener, Ont.; James A. O'Gilvy & Co., Montreal; Castle & Son, Regd., Montreal; Baetz Bros., Furniture Co., Kitchener, Ont.; Preston Furniture Co., Preston, Ont.; Henry Morgan & Co., Limited, Montreal; F. E. Coombe Furniture Co., Limited, Kincardine, Ont.; A. Krug & Co., Kitchener, Ont; Broomsgrove Guild, Canada, Limited, Montreal.

Thomas Finley, president of the Massey-Harris Co., Limited, Toronto, in commenting on the tariff situation, states that in his opinion free trade in agricultural implements means the inevitable shifting of the manufacture of such equipment for Western Canada, from Ontario and Quebec to the Western middle States. If there be neither tariff or sentimental preference to offset our geographical handicap, we shall be forced sooner or later to establish ourselves on equal terms with our competitors. So far as my company is concerned, we are not going to lose our Western Canadian trade, even if to retain it we have to build another factory in the Western States; therefore our workmen, and all co-related industries which furnish us with raw materials, are vitally interested in this question.

Crating Lumber

We specialize in the following Crating lumbers

Spruce, White Pine, Jack Pine, Norway Pine, Balm, Poplar, Birch, Maple, Basswood and Elm.

W. Y. Lloyd

350 Confederation Life Building
TORONTO, CANADA
PHONE MAIN 5532

British Columbia Forest Products

Technical Information

Information furnished as to the qualities, weights, strengths, and uses of all woods

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Samples of all British Columbia woods and literature for distribution

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Canadian Hardwoods

Good Stocks
Right Grades
Prompt Shipments

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of all descriptions

C. A. Spencer, Limited
Merchants and Manufacturers
McGILL BUILDING - MONTREAL

Hardwoods

Some items on hand in our Toronto Yards for Immediate shipment

4/4" To 16/4"

Ash	9870 ft.	Hickory	500 ft.
Basswood	49854 "	Maple, Birds-eye	1288 "
Beech	49085 "	Maple	36213 "
Birch	56697 "	Mahogany	12578 "
Chestnut	70813 "	Oak, Plain	62099 "
Cypres	29200 "	Oak, Qtd.	24445 "
Cherry	500 "	Poplar	46408 "
Elm	42657 "	Walnut	2753 "
Gum, Red	38089 "	Walnut, Circassian	3646 "
Gum, Sap	14494 "		

We can **KILN DRY** if desired

Our Dry Kilns are operating night and day to full capacity. We can also make car lots or mixed car shipments direct from mills.

The Gall Lumber Co. Ltd.
ESTABLISHED 1875
Foot of Spadina Ave. TORONTO

"Hardwoods
are moving and good stock getting scaree. We still have some desirable items of

Ash
Basswood
Birch
Elm

Will be glad to quote on request"

Canadian General Lumber Company, Limited
712 Bank of Hamilton Bldg.
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MONTREAL OFFICE: 203 McGill Bldg.

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Graves, Bigwood & Co.'s
Lumber, Lath and Box Shooks

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Quick Action Section

Equipment Materials Employment

GOOD VALUES

Subject to Prior Sale

These are only a few of our stock

Band Resaw, Connell & Dengler, 54 and 60″.
Band Rip Saw, Fay & Egan No. 202 chain feed.
Belt Sander, Curtis No. 20.
Circular Saw Mill, Hoosier Pony.
Circular Resaw, 44 in. heavy type.
Dowel Machines, Hayes & Fay.
Dowell Gluer and Driver, E. B. Hayes.
Door Clamp, Hayes Standard Power.
Jointer, Falls Machine Co., undercut 24 in.,
Jointers, 18″ and 24″.
Lathe, Back Knife Clement 40 in.
Moulder, Hermance 8 and 10 in., 4 side.
Moulder, Woods 10 and 12 in. inside.
Moulder, American 10 in., 4 side.
Matcher, American No. 229 fast feed hardwood flooring.
Planer, 30 in. Fay &Egan Single Cabinet.
Buzz Planer, 16 and 24 in.
Sander, endless bed 48 in., H. B. Smith.
Sander, Moore Machine Co., belt.

Woodworking Machinery Company of Buffalo,
54 Mechanic St.,
Buffalo, N.Y.

FOR SALE

Box-Board Printer, 18 x 44 in. Connell & Dengler, Two Color, Chain Feed, $950.00.
Moulder, 4-side, 10 in. American, $700.00.
Double Cut-off Saw, Automatic, Berlin No. 229, $775.00.
Band Resaw, 54 in. Berlin, with 3 saws, $1,100.00.
Slab Resaw, Fischer Little Giant, $375.00.
Railway Cut-off saw, S. A. Woods, No. 190, $200.00.
Box Groover, Chase-Turbine, No. 245 Automatic, $300.00.
Nailing Machines, Morgan and Doig, all sizes.

Chas. N. Braun Machinery Co., Fort Wayne, Ind., U.S.A.

For Sale

1—15″ Head Matcher
1—12″ Moulder
1—Embossing Machine
1—Spiral Rope Machine
1—Sander
24″ wide 6 ply Leviathan Belting

A large number of pulleys and some shafting.
Write for a full list.
All material at very reasonable prices.

Gold Medal Furniture Mfg. Co.,
Toronto 9-10

Position Wanted

Energetic young man experienced in the manufacture and selling of furniture, desires to represent furniture manufacturer in Eastern Canada or would consider opening in designing department. Best reference. Box 116 Canadian Woodworker, Toronto, Ont.

Foreman Wanted

For furniture factory good Ontario town, man familar with all departments who can push production and handle men. Apply stating qualifications and wages expected. Correspondence treated as confidential. Apply Box 115, Canadian Woodworker, Toronto. 10

Purchasing Agent

Open for engagement, 12 years' experience in purchasing production and costs accounting. Specially qualified on lumber, veneers, varnishes and machinery. Box 114, Canadian Woodworker, Toronto. 10

Foreman Wanted

FOREMAN WANTED for Sash, Door and General Woodworking Factory in Eastern Canada. Man wanted must be first class mechanic, understand thoroughly Woodworking Machinery and be able to lay out his work. Steady position for the right man. State clearly first letter experience whom worked for, age, married or single, wages required, and when ready for work if application is accepted. Apply Box 117, Canadian Woodworker, Toronto. 10.

Business Opportunity

Canadian Patents and Registered Trade Mark of the Thermo-Myst Lumber Dryer FOR SALE

Excellent business opening to parties with knowledge of lumber industry and moderate amount capital, to establish a business for which there is a lucrative field in Canada. The Dry Kiln that has proven its merits in the United States. Write or call on R. MacLeay, 179 Duke St., Montreal, Que., for further information. 10

Alphonse Dugre, Notre Dame St., is awarded general contract for erection of office costing $50,000 for St. Maurice Lumber Co.

Building Plans for July in Manhattan Borough Extension

The report of Rudolph P. Miller, super-Manhattan, New York City, is to the effect that during the month of July this year plans were filed for fifty-three new buildings costing a total of $17,878,825, as against 141 costing a total of $6,269,800 for the corresponding month of 1920. The gain is mostly in office buildings. During July, 1920, plans were filed for the erection of nine to cost $2,190,000, whereas during July of this year six office buildings costing $13,500,000 were planned.

Strength Tests of Ideal Walls

An investigation has been started to determine the compressive strength of ideal brick walls in co-operation with the Common Brick Manufacturers' Association of America. The ideal walls are laid with common brick, but in such a manner as to include an air space in the wall and still be well tied together. There is a considerable saving in the number of bricks, the amount of mortar and the time required to lay these walls over the ordinary solid walls. It is also claimed that one can plaster directly on these walls, thus avoiding the expense of studding, lath, etc. The present schedule calls for the erection of three ideal walls and two solid ones for comparison. Four of the walls have already been built by the Bureau of Standards and will be tested as soon as they are 30 days old. Considerable preliminary work such as gauge calibration and the testing of individual bricks has already been done.

550-Ft. Concrete Warehouse Without Joints

A seven-story concrete building, 550 ft. long and 100 ft. wide, has been erected in Los Angeles as the third unit in the Los Angeles Union Terminal. The other two buildings are of the same general plan and are 600 ft. in length. Differing from the other units in a few particulars, the recently completed structure has no expansion joints. This feature very considerably reduces the number of columns because where expansion joints were put in at 200-ft. intervals in the other structures twin columns were requierd, a set on each side of the joints on each floor. Observations will be made to see what difference there is in the action of the buildings with and without expansion joints. Graduated brass gauges have been set at the top of the four corners of each building in prolongation of the side walls, and these will be read with a transit from time to time to note any change in position. Measurement of the movement of adjoining sections at the expansion joints will also be made. The design and construction of the building was in charge of J. H. Dockweiller, constulting engineer, at whose instance the expansion joints were eliminated from the design of the new unit.

What Constitutes Walnut Furniture?

A clearer definition of furniture terms is desirable, from the viewpoint of both manufacturer and dealer. We hear of furniture in solid walnut, real walnut, walnut finish, chrome walnut and other names of a similar nature. To the uninformed, which means to the buying public in general, this state of affairs is confusing and misleading to a large degree. A person may purchase a piece of furniture which has been described as "walnut finish," under the impression that they were securing a piece of solid walnut.

The American Walnut Manufacturers' Association have classified the kinds of furniture which may be sold as walnut furniture and bought as walnut furniture without deceit on the part of the seller or regret on the part of the buyer as follows:

1. Solid Walnut. This is a piece made entirely of walnut lumber, inside and out, in which no panels or veneerd plywood is used. There is relatively a small amount of such furniture manufactured, and it is usually hand work, produced on special orders.

2. All Walnut. This is furniture such as dressers and sideboards and tables, in which all the wood employed is walnut except that on table tops, drawer fronts and sides there may be walnut face veneer panels. This construction is really as desirable as solid walnut, and in many ways superior, and is the one most commonly used in genuine walnut furniture.

3. Standard Walnut. In this furniture all the surfaces and exposed parts, including all the solid pieces, such as rails, legs, and other exposed parts of the framework, are of genuine solid walnut. The larger surfaces may be of walnut face veneer panels as described above. The backs and interior parts may be of some other wood.

The following kinds of furniture cannot truthfully be sold as walnut, and in practically every furniture store in the country will be found furniture that comes under this classification:

1. Furniture finished in walnut brown, and having walnut face panels on the larger surfaces and perhaps a small amount of solid wood pieces in conspicuous places, but the solid wood being principally some other kind.

2. Furniture having only walnut face panels on the larger surfaces, with the entire construction of some other wood. In this classification falls a very large amount of the medium priced furniture that is to-day sold as American walnut. By weight or volume such furniture is less than one per cent. walnut, and should not be so designated.

3. Furniture made entirely of some other wood, including the face panels, but finished in a walnut brown. This is the cheapest of the different types of so-called walnut furniture to be found on the market, and the name walnut should not be used in connection with it in any way, as such use cannot help but be misleading.

About 6,000 tons of briarwood are shipped yearly from the island of Corsica to be used in the manufacture of pipes. The root is the part used. It is a small tree (not a briar) and is simlar to the laurel employed for pipes in this country. The name comes from a French word "bruye," meaning bush.

The Sidman

Lumber Curing Process

Can now be housed in a CONCRETE BUILDING

(Patent Pending)

We can now guarantee that our CONCRETE BUILDING, will lose no more heat units than the best constructed wooden building, and 20% to 40% less than brick, and HAVE ABSOLUTE CONTROL OF THE HUMIDITY.

A new departure in kiln buildings, perfected after years of experiment, and on top of many failures.

Some of the benefits:

Lower first cost. Practically no expense for repairs. Economy in operation, Fire Proof inside and out.

Let us tell you where you can see them in operation.

MADE IN CANADA
NO DUTY OR EXCHANGE

The Sidmans of Canada

Lumber Curing Specialists

LONDON THE S.L.C.K. Reg. Trade Mark **ONTARIO**

Information and Inquiries

You are cordially invited to make use of this department

Market for Dimension Stock

Warren, Ont., Sept. 23rd 1921.

Editor, Canadian Woodworker,—

I am about to operate a picket and dimension mill, cutting stock, especially for woodworkers, and furniture manufacturers. Can you give me any idea as to what might be considered standard sizes for dimension material of this kind? The stock I have runs up to 4 feet in length and can be sawn any dimension from 1-inch square up.

Yours truly,
D. I. WARREN.

At the present time there are no recognized standard sizes for dimension stock. The requirements of each manufacturer differ according to the lines he produces. The best thing for you to do is to get in touch with a number of furniture men or other woodworkers who make a practice of buying their material cut to dimension, ascertain their requirements and then quote on their business.

Built Up Table Rims

Victoriaville, P. Q., Oct. 3rd 1921.

Editor, Canadian Woodworker,—

Was wondering if you could tell us where we can secure built-up rims for tables, 48 x48 in either walnut or quarter cut oak.

Sincerely yours,
ALBERT HUDSON.

It is just possible that you can secure these rims in Canada either from Panels, Limited, Southampton, Ont., or from the Bruce Woodworkers Co., Limited, Chelsey, Ont. Other probable sources of supply are Gorham Bros., Mount Pleasant, Mich., Breece Mfg. Co., Portsmouth, Ohio, and the Jefferson Woodworking Co., Louisville, Ky.

Composition Carvings Wanted

Moncton, N. B., Sept. 30th 1921.

Editor, Canadian Woodworker,—

Will you kindly inform me where I can secure composition capitals, cut four sides, for 4-inch and 5-inch posts. Would like to deal with a Canadian firm, if possible.

Thanking you in anticipation, I am,
Yours truly,
A. P. LeBLANC.

Composition carvings, such as you require, can be secured from J. Walter & Son, Kitchener, Ont., and the Decorators' Supply Co., Archer, Leo & Lime Sts., Chicago, Ill.

Clothes Drying Cabinets

A large Canadian firm has sent in an inquiry asking to be put in touch with manufacturers of clothes drying cabinets, either gas or electrically heated. Any readers of the "Canadian Woodworker," who manufacture drying cabinets of this type, can secure the name of this firm by writing the editor.

Information on Bronzing and Burnishing

Montrael, Sept., 28th 1921.

Editor, Canadian Woodworker,—

Can you instruct me how to bronze and burnish hand-carved picture and photo frames? Would be very much obliged for any information that you may be able to furnish on this subject.

Sincerely yours,
A. ALEXANDER.

We have not any information covering this particular operation and do not know where you can secure any. Any readers of the "Canadian Woodworker," who have had experience in bronzing and burnishing can help out a fellow-workman by sending a brief description of this operation into the editor of this publication.

In Market for Wire

A Gilmore, Coaticook, P.Q., manufacturer of chairs, uses a considerable quantity of 14-gauge wire in the run of a year, and would like quotations in ton lots, delivered at Coaticook, from interested parties.

Small Wood Balls Wanted

Toronto, Oct. 12th, 1921.

Editor, Canadian Woodworker,—

Can you tell us wher we can have 1¾-inch wood balls turned for a small bowling game we are manufacturing? We have tried all the wood turners in Toronto, but find that their prices are too high. This is due perhaps to the face that they are not equipped with automatic machines for producing articles of this nature. Any information you can supply will be appreciated.

Yours truly,
Alliston Wood Products, Limited.

It is just possible that you can secure the turnings you require from the following manufacturers: Canada Wood Specialty Co., Orillia, Ont.; Wood Turning Products, Limited, Fenelon Falls, Ont.; Otterville Mfg. Co., Otterville, Ont.; Knight Bros. Co., Burk's Falls, Ont.

E. T. Carter & Co. Limited

Quality Guaranteed

FIBRO PRODUCTS
REEDS - WASTE - RESIN
TURPENTINE
RATTANS - LINTERS

Prompt Shipment

84 Front Street, E. - Toronto

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CABLE ADDRESS
"DARLOVE"

TWO BAND MILLS

CODES USED
UNIVERSAL
A.B.C 5TH EDITION IMPROVED
WESTERN UNION

The following is a list of unsold lumber on our Yards, nearly all of which is dry and available for prompt shipment. We solicit your inquiries and orders.

QUARTERED WHITE OAK

Ft.	In.	
50,000	3/4	No. 1 C&S
15,000	4/4	No. 1 C&S. Strips 2½-5½ in.
60,000	3/4	No. 2 Com.

PLAIN WHITE OAK

50,000	5/8	No. 1 C&S
25,000	1/2	No. 2 Com.

PLAIN RED OAK

20,000	5/8	12&Wdr. Cof. Bds.
20,000	3/4	12&Wdr. Cof. Bds.
6,000	3/8	FAS
40,000	1/2	FAS
250,000	5/8	No. 2 Com.
300,000	5/8	No. 3 Com.
200,000	3/4	No. 3 Com.

ELM

18,000	12/4	No. 1 C&S
45,000	6/4	Log Run.
60,000	8/4	Log Run.
12,000	6/4	No. 2 Com.
15,000	10/4	No. 2 Com.
15,000	12/4	No. 2 Com.
75,000	5/8	No. 3 Com.
40,000	3/4	No. 3 Com.

CYPRESS

15,000	4/4	FAS
15,000	5/4	FAS
60,000	6/4	FAS
60,000	12/4	FAS
30,000	4/4	Sel.
30,000	6/4	Sel.
75,000	4/4	No. 1 Shop.
60,000	6/4	No. 1 Shop.
45,000	8/4	No. 1 Shop.
15,000	6/4	No. 1 Com.
15,000	8/4	No. 1 Com.
30,000	6/4	No. 2 Com.
30,000	4/4	Peck.
30,000	1x6	No. 1 Com.
60,000	1x6	No. 2 Com.
45,000	1x6	No. 1 Boxing.

COTTONWOOD

45,000	4/4	FAS 6-12 in.
45,000	4/4	No. 1 C&S

PLAIN RED GUM

30,000	3/8	No. 1 C&S
20,000	3/4	No. 1 C&S
30,000	4/4	No. 1 C&S

PLAIN SAP GUM

75,000	5/8	FAS 6-12 in.
20,000	3/4	FAS 6-12 in.
40,000	5/8	FAS 10-12 in.
40,000	5/8	FAS 13-17 in.
100,000	3/4	FAS 13-17 in.
30,000	4/4	FAS 18-21 in.
20,000	4/4	FAS 20 in. and up.
25,000	5/8	No. 1 C&S
150,000	3/4	No. 1 C&S
30,000	4/4	No. 1 C&S
20,000	5/8	No. 2 Com.
30,000	8/4	No. 2 Com.
20,000	5/8	No. 3 Com.

QUARTERED RED GUM

40,000	5/8	FAS
17,000	3/4	FAS
100,000	5/8	No. 1 C&S
200,000	3/4	No. 1 C&S
15,000	4/4	No. 1 C&S
30,000	5/4	No. 1 C&S
40,000	6/4	No. 1 C&S

QUARTERED RED GUM
(Sap No Defect)

60,000	5/8	FAS
60,000	3/4	FAS
50,000	4/4	FAS
40,000	6/4	FAS
75,000	8/4	FAS
75,000	5/8	No. 1 C&S
125,000	3/4	No. 1 C&S
50,000	4/4	No. 1 C&S
15,000	6/4	No. 1 C&S
15,000	8/4	No. 1 C&S

ASH

4,000	3/8	No. 1 C&S
3,000	5/4	No. 1 C&S
4,000	6/4	No. 1 C&S
12,000	12/4	No. 2 Com.
15,000	4/4	No. 3 Com.
7,000	12/4	No. 3 Com.

It is understood that our stocks are constantly changing by reason of manufacture and shipment. We are prepared to surface one or two sides.

Our Sales Representative in the Chicago and Michigan Territories is the

LELAND STAVE & LUMBER COMPANY

HOME OFFICE LELAND, MISSISSIPPI

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LELAND, MISS.
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CHICAGO OFFICE
1039 MARQUETTE BUILDING
PHONE RANDOLPH 7957

C.W PARHAM, MANAGER

The Lumber Market

Imported Woods

A distinct improvement can be noted in the lumber situation in the various producing centres in the United States. The demand for hardwoods of all kinds, and more particularly for the upper grades, is showing signs of increasing, and at the same time inquiries are coming in in a very satisfactory manner. The tone of the whole market is better, and the opinion is current that the situation has finally and definitely turned for the better. There has been an advance of from $3.00 to $10.00 per M on many upper grade items. This is due to the fact that there is a marked shortage of good stock.

The wood-using industry is gradually coming to the conclusion that the lumber situation is not quite as favorable as they were fond to assume. Production has been low for many months, and while in the spring the amount of manufactured lumber on hand was practically equal to normal, this has been gradually reduced from month to monuth until to-day we find the stocks badly broken and upper items practically off the market. It has been stated by those who are in a position to know, that it would be impossible to secure sufficient high-grade hardwood to fill one thousand cars. As there are thousands of lumber-consuming plants who could handle many carloads, it will be seen that the supply of high-grade lumber is not nearly sufficient to meet all possible and probable requirements.

In the Memphis district it is generally agreed that not only is there a better undertone to the whole market, but that values as a whole have stabilized and stiffened dnring the past few weeks. This applies chiefly to all grades above No. 2 common. Production is extremely light, not only at the present moment, but for the balance of the year, while shipments are increasing in a gratifying manner and orders and inquiries are coming in more freely. There is not much demand for the lower grades. Consuming interests are taking a greater interest in the market and are showing a more pronounced tendency to buy. A report from Evansville, Ind., is along similar lines. Collections are good and genral business conditions show an improvement.

According to a Louisville, Ky., report, the demand for high-grade hardwoods continues to increase without any corresponding increase in production. At the present moment there is very little stock to be had which will grade No. 1 common or better. The flooring mills are doing a nice volume of business and are in the market for oak. Walnut is in strong demand, as well as poplar and red gum. The other hardwoods are not showing any increased activity. Since September 1st the better grades of red gum, oak and poplar, have incresed anywhere from $5.00 per M up.

The reports from practically all the hardwood-producing centres are extremely optimistic, and this optimism seems to be justified, in view of the fact that the advance of from $3.00 to $10.00, which has taken place, is general, and is not confined to any one market or any one locality. From the fact that the improvement is general, it is safe to assume that the market has taken a decided turn for the better.

Domestic Woods

Signs are not lacking which would lead one to believe that the improvement manifested in the lumber markets is an indication that the corner has been definitely rounded. This is not borne out so much by any large increase in the volume of sales made, but more by the fact that a much better feeling exists in lumber centres and that the price-cutting and price readjustments, which have been such a disturbing factor in the past, are over and prices are more or less stabilized. This statement has been made before, but to-day it is made with greater assurance than ever in the belief that the bottom has been reached. Several large sales of pine and hemlock running into millions of feet, have been made during the last few weeks. True this stock was turned at a low figure, but the fact that it was turned at all is a good omen. Both these woods are beginning to show signs of returning strength, and it would not be at all surprising if quotations on the sotcks were to show a tendency to increase. Probably one of the weakest items on the list is spruce. Very little of this wood has been moved during the present season. What call there has been for this lumber has been for the better grades. Coming to hardwoods, there is a slight improvement in demand, coupled with a scarcity of the upper grades in the heavier stocks. The offerings in birch, maple and similar woods are limited, and any quotations made are being given on the basis of No. 2 common and better. The furniture factories are coming into the market in greater numbers and the implement and motor car manufacturers are displaying a tendency to sort up and replenish their short lines.

There have been many rumors going around with regard to the quantity of lumber on hand, the amount cut during the past season, the number of sawmills shut down and the limited nature of the logging operations for the coming season, preparations for which are now being made. It is not possible to present any general outline covering the probable cut during the coming winter, and comparing it with that of a year ago. Conditions differ in various localities. There are, however, several features which practically parallel themselves in all centres, such as the drop in wages and the readiness of the men to enter the woods.

One reason why it is difficult to give a clear outline of coming operations is the fact that many millmen are adverse to giving out any information with regard to their future operations. It is about as one correspondent has suggested in his reply to our inquiry for information with regard to their future operations. It is about as one correspondent has suggested in his reply to our inquiry for information on his woods operations: "We expect to be doing very little in the bush this fall. If conditions continue to improve we shall, probably, do as some others do and shout that we are not going into the bush at all, and then go in and take out all the logs we can."

If you have a great deal of repetition work to do on a spindle, do not use the slotted cutters, but have a special solid cutter made to do the work. Five or more cutting edges are much beter than two.

It will certainly pay you to try high-speed steel cutters for long runs of mouldings. Be sure that your workmen do not spoil these cutters by overheating them in the grinding.

THE CHICAGO MIRROR
AND
ART GLASS COMPANY
Manufacturers
of
RELIABLE MIRRORS
AND
PLATE GLASS TOPS
Send your specifications
to us at
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Calhoun Plywood Company
Panels Tops Counter Fronts
OPERA CHAIRS
in the White or finished.
Vegetable or Waterproof
Glue.
Sheboygan - Wisconsin

IN TRANSIT YARD
TORONTO

Million Feet Bone Dry Hardwoods

Orders can be filled immediately

PHONE MAIN 210
705 Excelsior Life Building, Toronto
Anderson-Miller Lumber Co., Limited

In using "*Steelgrip*" CLAMP NAILS only the ordinary machine work is required. Cut a slot, drive in a "Steelgrip," that's all. No clamping, no waiting for glue to set.
Avoid Substitutes
"*Steelgrip*" CLAMP NAILS
Save Time + Labor = Money
Produce, Strength + Durability = Better Product
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For lightness combined with strength this clamp has no equal. All parts are selected from the best materials obtainable and we have spared no effort to make the "Pony" the finest thing of its kind on the market. Made in sizes to open 18 in. to 72 in.

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Peerless Adjustable Hand Clamp

Fits every grip without a slip and takes a tighter hold with less effort. It is a tool of real economy and a clamp that insures efficiency.

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Colt's Clamps

for the

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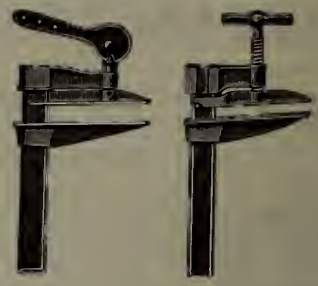

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Colt's Clamps are quick-acting and have broad jaw clamping surface.

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Manufactured by

C. CHRISTIANSEN

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There is no question about it. EMPIRE all steel clamps do the work with less chance of failure than any other you can purchase. In scores of shops where they are in daily use results bear out the truth of this statement. If you will try them once you will be convinced.

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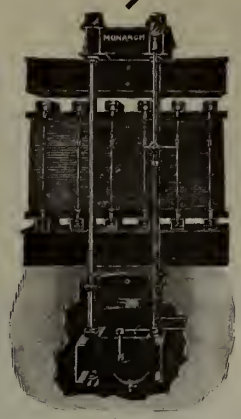
We specialize in all types of woodworking tools.

Empire Tool Works

Toronto - Ontario

Farquhar Hydraulic Machinery



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Petrie, H. W., Toronto, Ont.
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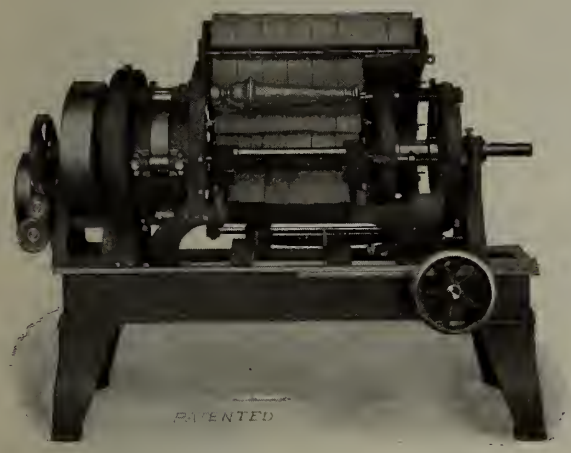

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Get it now.

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PLANER KNIVES and CUTTERS

OF ALL DESCRIPTIONS

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plus its EQUIPMENT—
plus the SERVICE of the MAKER—
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OUR PROCESS assures the control of the three fundamental factors—HEAT—HUMIDITY—CIRCULATION.

OUR EQUIPMENT is guaranteed complete, sturdy in construction, simple in its installation, economical to maintain.

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OUR ORGANIZATION has been composed of woodworkers for thirty-five years, men who know wood and have handled it through the complete range of manufacturing operations.

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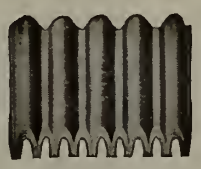
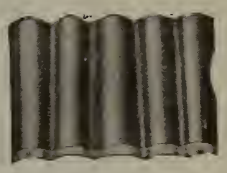
Cary's SUPERIOR QUALITY
Corrugated Fasteners



SAW EDGE



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Taylor Mfg. Co., Jas. L., Poughkeepsie, N.Y.

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International Electric Co., Indianapolis, Ind.
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GLUE SPREADERS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener.

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Garlock-Walker Machinery Co., Toronto, Ont.
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GRINDERS (Knife)
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Cowan & Company, Galt, Ont.
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Garlock-Walker Machinery Co., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
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Yates Machine Co., P. B., Hamilton, Ont.

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Jackson, Cochrane, & Company, Kitchener, Ont.

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Gum Lumber Association, Memphis, Tenn.
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Paepcke-Leicht Lumber Co., Chicago, Ill.
Sondheimer Co., E., Memphis, Tenn.

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HANDLE & SPOKE MACHINERY
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Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Whitney & Son, Baxter D., Winchendon, Mass

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Dooley Lumber Co., F. T., Memphis, Tenn.
Evansville Band Mill Co., Evansville, Ind.
Frye Lumber & Veneer Co., J. W., Dayton, O.
Gayoso Lumber Co., Memphis, Tenn.
Hall Lumber Co., Thos., Charleston, W.Va.
Heeney, Percy E., Kitchener, Ont.
Hyde Lumber Co., South Bend, Ind.
Kosse, Shoe & Schleyer Co., Cincinnati, O.
Kraetzer-Cured Lumber Co., Greenwood, Miss.
Leach & Co., J. D., Chicago, Ill.
Liverpool Hardwood Co., New York.
London Lumber Co., London, Ont.
Long-Knight Mfg. Co., Indianapolis, Ind.
Luehrman Hardwood Lbr. Co., St. Louis, Mo.
May Bros., Memphis, Tenn.
McLean Mahogany & Cedar Co., Buffalo, N.Y.
McLennan Lumber Co., Montreal, Que.
Memphis Band Mill Co., Memphis, Tenn.
Mengel Co., Louisville, Ky.
Merceau-Hawkins Tie Co., Huntington, W.Va
Mowbray & Robinson, Cincinnati, Ohio.
Murrelle Lumber Company, Memphis, Tenn.
Nicholson & Co., E. M., Montreal, Que.
Nichols & Cox Lumber Co., Grand Rapids, Mich.
Otis Mfg. Co., New Orleans, La.
Paepcke Leicht Lumber Co., Chicago, Ill.
Payson, Smith Lumber Co., Minneapolis, Minn.
Pedwell Hardwood Lumber Co., Toronto, Ont.
Perkins Bros., Kelso, Ark.
Peytona Lumber Co., Huntington, W. Va.
Pickrel Walnut Co., St. Louis, Mo.
Powe Lumber Co., Thos. E., St. Louis, Mo
Rush Lumber Co., Memphis, Tenn.
Sawyer Goodman Co., Marinette, Wis.
Sondheimer Co., E., Memphis, Tenn.
Spencer, C. A., Montreal, Que.
Spotswood & Son, E. R., Lexington, Ky.
Stark & Co., Jas. E., Memphis, Tenn.
Stimson Hardwood Co., J. V., Memphis, Tenn.
Stimson & Co., J. V., Owensboro, Ky.
Tallahatchie Lumber Co., Memphis, Tenn.
Tennessee Lumber & Coal Co., Cincinnati Ohio.
Thompson, Katz Lumber Co., Memphis, Tenn.
Thompson & Co., Lewis, Philadelphia, Pa.
Upham & Walsh, Chicago, Ill.
Vail Cooperage Co., Fort Wayne, Ind.
Warren-Ross Lumber Co., Jamestown, N.Y.
Whiting Co., Wm. S., Johnson City, Tenn.
Wisconsin Lumber Co., Chicago, Ill.
Wayne Lumber Co., New York
Wood Mosaic Co., Louisville, Ky.
Yellow Poplar Lumber Co., Coal Grove, Ohio.

HYDRAULIC VENEER PRESSES
Perrin & Company, Wm. R., Toronto, Ont.

INSURANCE
Lee Blakemore, Inc., Toronto, Ont.

KNOBS
Waddell Mfg. Co., Grand Rapids, Mich.
Rowe Mfg. Co., Newaygo, Mich.

JOINTERS
Canada Machinery Corporation, Galt, Ont.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

KNIVES (Planer and others)
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

LATHES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

LEATHER (Artificial)
Fibro Mfg. Company, Beverly, N. J.
Mechanical Leathers, Ltd., Toronto.

LEATHER CLOTH
Zapon Leather Cloth Co., New York.

LUMBER MEASURER
Durant Mfg. Co. Milwaukee, Wis.

MACHINE KNIVES
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Peter Hay Knife Company, Galt, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont

MIRRORS
Chicago Mirror & Art Glass Co., Chicago, Ill.

MITRE SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.

MOTOR TRUCK EXTENSIONS
Swedish Crucible Steel Co., Windsor, Ont.

MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A. Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

NAILS
Laidlaw Bale-Tie Co., Hamilton, Ont.

NAILING MACHINES
Morgan Machine Co., Rochester, N.Y.

OIL
Zero Oil Co., Parkersburg, Pa.

OIL STONE GRINDERS
Mummert-Dixon Co., Hanover, Pa.
Oliver Machinery Co., Grand Rapids, Mich.

PANELS
Algoma Panel Co., Algoma, Wis.
Gorham Bros., Mount Pleasant, Mich.
Hardwood Products Co., Nennah, Wis.
Hay & Co., Woodstock, Ont.
Roberts, Geo. G., Chicago, Ill.
Waetjin & Co., L., Milwaukee, Wis.

PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PERIOD MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich

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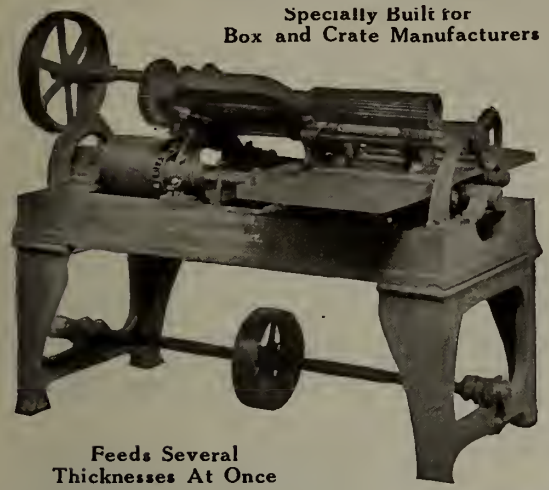

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1—Jig Saw, McGregor Gourlay, Wood Top.
1—Double Disc Sander, American, 36″.
2—Hand Screw Veneer Presses, 38″—3 Screw American.
1—Gravity Swing Cut-off Saw, McGregor Gourlay.
1—12″ Moulder, Cowan & Co., 4-sided.
1—16″ Buzz Planer, Clark-Demill.
1—36″ Preston Band Saw.
1—28″ Band Saw.
1—7″ Moulder, Cowan & Co., 3-sided.
1—Sash Sticker, H. W. Petrie.
1—Double Surfacer, C.M.C., No. 212—30″.
1—Dowelling Machine, M31, Cowan & Co., No. 2, Cap. up to 2½″.
1—Planer and Matcher, S. A. Woods, 15″ x 6″.
1—Double Exhauster, 45″, American Blower Co.

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Casey Co., M. E., Montreal, Que.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLANING MILL MACHINERY
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Mattison Machine Works, Rockford, Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PRESSES (Veneer)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Jackson, Cochrane & Company, Kitchener, Ont.
Perrin & Co., Wm. R., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

REED
Carter & Co., E. T., Toronto, Ont.
Overseas Reed and Cane Co., Ionia, Mich.

REED MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

RESAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

RIM AND FELLOE MACHINERY
Defiance Machine Works, Defiance, Ohio.
Fay & Egan Co., J. A. Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mackenzie Machinery Co., D., Guelph, Ont.
Mattison Machine Works, Rockford, Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

ROSETTES
Waddell Mfg. Co., Grand Rapids, Mich.

RUBBING MACHINES
DeVilbiss Mfg. Co., Toledo, Ohio.
Mattison Machine Works, Rockford, Ill.

SAFETY DEVICES
Cowan & Company, Galt, Ont.

SANDERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SASH, DOOR & BLIND MACHINERY
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SAWS
Atkins & Co., E. C., Hamilton, Ont.
Disston & Sons, Henry, Toronto, Ont.
Radcliff Saw Mfg. Company, Toronto, Ont.
Seibert & Co., Louis, Cincinnati, Ohio.
Shurly-Dietrich, Ltd., Galt, Ont.
Simonds Canada Saw Co., Montreal, Que.

SAW SHARPENERS
Hooker & Son, O. V., St. Johnsbury, Vt.
Oliver Machinery Co., Grand Rapids, Mich.

SAW SWAGES
Atkins & Co., E. C., Hamilton, Ont.
Cowan & Company, Galt, Ont.
Crowel, D. J., Buffalo, N. Y.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.

SAW TABLES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SCRAPING MACHINES
Canada Machinery Corporation, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Whitney & Sons, Baxter D., Winchendon, Mass.

SCREW DRIVING MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.
Reynolds Machine Co., Massillon Ohio.

SCROLL SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Jackson, Cochrane, & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamiltonfi Ont.

SECOND-HAND MACHINERY
Casey, M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Osborne Sexton Machinery Co., Columbus, O.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Woodworking Machinery Co. of Buffalo, Buffalo, N.Y.

SHAPERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Sons, Baxter D., Winchendon, Mass
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SHAVING COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

STAINS
Ault & Wiborg, Toronto, Ont.
Williams Bros. & Co., Hounslow, Eng.

SINGLE SPINDLE BOXING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

STAVE SAWS
Atkins & Co., E. C., Hamilton, Ont.

STAVE SAWING MACHINE
Whitney & Son, Baxter D., Winchendon, Mass

STEEL DOOR MATS
Cary Mfg. Company, Brooklyn, N.Y.

SURFACERS
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Yates Machine Co., P. B., Hamilton, Ont.

SWING SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Eaglesfield, R. D., Indianapolis, Ind.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE LEG LATHES
Fay & Egan Co., J. A., Cincinnati, Ohoa.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE SLIDES
Jefferson Woodworking Co., Louisville, Ky.
Walter & Company, B., Wabash, Ind.

TEMPERATURE REGULATORS
Canadian Powers Regulator Co., Toronto, Ont.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Compan, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TIME CLOCKS
International Business Machines Co., Toronto, Ont.

TOPS
Gorham Bros., Mount Pleasant, Mich.

TRIMMERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Pretson, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TRUCKS
Cowan Truck Company, Toronto, Ont.
National Dry Kiln Co., Indianapolis, Ind.
Oliver Machinery Co., Grand Rapids, Mich.

TURNED WOOD GOODS
Algoma Wood Products Co., Algoma, Wis.
Canada Wood Specialty Co., Orillia, Ont.
Rowe Mfg. Co., Newaygo, Mich.

TWINES & WEBBING
Doon Twines, Ltd., Kitchener, Ont.

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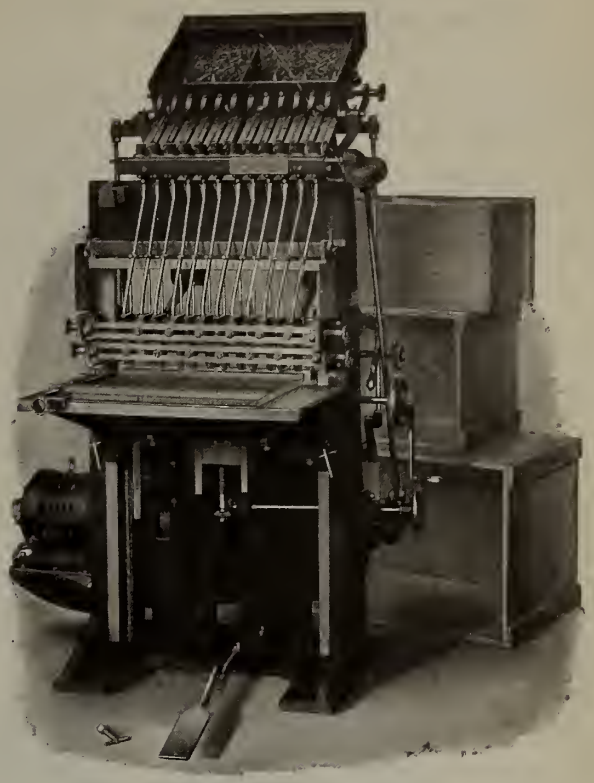

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VARNISHES
Adams & Elting Co., Chicago and Toronto.
Ault & Wiborg Company, Toronto. Ont.
Penfound Varnish Co., Toronto, Ont.

VARNISH DRYERS
Nicholls Co., A. S., New York, N.Y.

VARNISH SPRAYERS
DeVilbiss Mfg. Co., Toledo, Ohio.
Paasche Air Brush Company, Chicago, Ill.

VENEERS
Batesville Lumber & Veneer Co., Lawrenceburg, Ind.
Birds Eye Veneer Co., Escanaba, Mich.
Bury & Compny, Robert, Toronto, Ont.
Central Lumber Co., Indianapolis, Ind.
Christmann Veneer & Lumber Co., St. Louis, Mo.
Curtis Co., C. E., Chicago
Dean Spicker Company, Chicago, Ill.
Empire Veneer Company, Chicago, Ill.
Evansville Veneer Co., Evansville, Ind.
Freiberg Lumber Co., Cincinnati, Ohio
Frye Lumber & Veneer Co., J. W., Dayton, O.
Hartzell, Geo. W., Piqua, Ohio.
Hoffman Bros. Company, Fort Wayne, Ind.
Holden, Henry S., Chicago, Ill.
Hardwood Prudocts Co., Neenah, Wis.
Korn-Conkling Co., Memphis, Tenn.
Long-Knight Lumber Co., Indianapolis, Ind.
Litton Veneer Co., Rockford, Ill.
Memphis Veneer & Lumber Co., Memphis, Tenn.
Mowhawk Veneer Co., Warren, Pa.
Munising Woodenware Co., Munising, Mich.
National Veneer & Lumber Co., Indianapolis, Ind.
North Vernon Lumber Co., North Vernon, Ind.
Northwestern Cooperage & Lumber Co., Gladstone, Mich.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod-Jurden Co., Memphis, Tenn.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Veneer Co., New Albany, Ind.
Roberts, Geo. G., Chicago, Ill.
Southern Veneer Mfg. Co., Louisville, Ky.
Stimson Veneer & Lumber Co., Memphis, Tenn.
Talge Mahogany Co., Indianapolis, Ind.
Thompson & Co., Lewis, Philadelphia, Pa.
Toronto Veneer Company, Toronto, Ont.
Veneer Manufacturers Co., Chicago, Ill.
Waetjen & Co., George L., Milwaukee, Wis.
The Williamson Veneer Company, Mills—Baltimore, Md. Sales Branches, New York, N. Y., Chicago, Ill., Jamestown, N.Y., High Point, N.C.
Warren Ross Lumber Co., Jamestown, N. Y.
Wood Mosaic Co., Louisville, Ky.

VENEER SAWS
Atkins & Co., E. C., Hamilton, Ont.

VENEER TAPE
Canadian Nashua Paper Co., Peterboro, Ont.
Gummed Products Co., Troy, Ohio.
Ideal Coated Paper Co., Brookfield, Mass.

VENTILATING APPARATUS
Canadian Blower & Forge Co., Kitchener, Ont.
Neville-Cooper Co., Toronto.

VENEER JOINTERS
Garlock-Walker Machinery Co., Toronto, Ont.

VENEER MACHINERY
Garlock-Walker Machinery Co., Toronto, Ont.
St. Joseph Iron Works, St. Joseph, Mich.

VENEER PRESSES (Hand and Power)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont
Perrin & Company, Wm. R., Toronto, Ont.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WALNUT LUMBER
American Walnut Mfrs. Assn., Chicago.
Frye Lumber & Veneer Co., J. W., Dayton, Ohio.
Pickrel Walnut Company, St. Louis.
Porter, Frank R. Washington, D.C.
Purcell Walnut Lumber Co., Frank, Kansas City.

WINDOW FRAME MACHINE
Atlas Mfg. Co., Orlando, Florida.

WIRE
Laidlaw Bale-Tie Co., Hamilton, Ont.

WIRE BOX STRAPPING
Cary Mfg. Company, Brooklyn, N.Y.

WOOD FINISHES
Ault & Wiborg, Toronto, Ont.
Penfound Varnish Co., Toronto, Ont.

WOODWORKING MACHINERY
General Machinery Co., Toronto, Ont.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOOD STAINS
Williams Brothers & Co

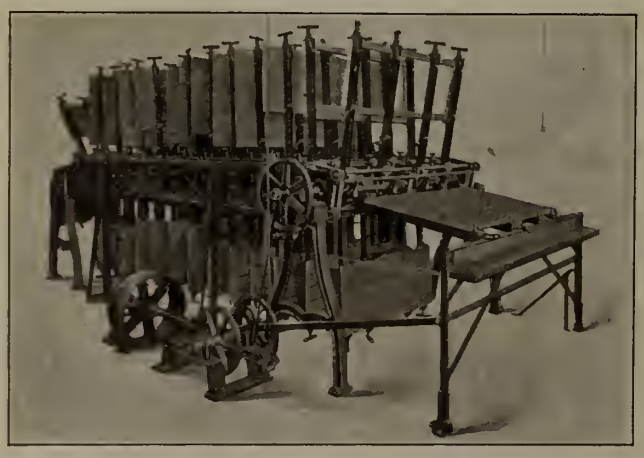
WOOD TURNING MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Yates Machine Co., P. B., Hamilton, Ont.

WORK BENCHES
Fay & Egan Co., J. A., Cincinnati, Ohio
Oliver Machinery Co., Grand Rapids, Mich.

WOOD LATHES
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOODWORKING SPECIALTIES
Brantford Pattern Works, Brantford, Ont.

One Man Does the Work of Two
with a Billstrom Glue Clamp Carrier



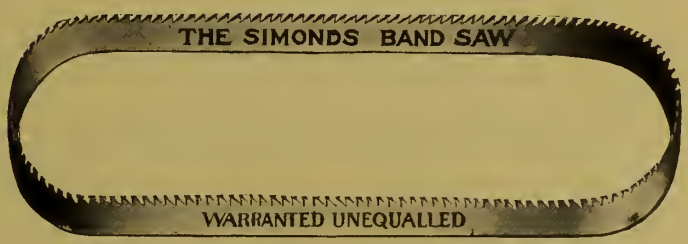
For every plant where much edge-gluing is done there is a real need for a Billstrom.
Here's why:—

The empty clamp is held at just the right height for the greatest convenience of the workman.
When the clamp is filled he pulls a cord, which carrics the filled clamp away and deposits an empty one in its place.
One man can accomplish as much by using it as two men can do employing the old methods.
It holds the work off the floor until the glue has set, when the glued stock can be quickly removed and piled flat, thus greatly conserving space.
It reduces the labor and cost of edge gluing to the minimum.
There is a sizs to suit your particular requirements.

N. J. BILLSTROM
2002 NINTH ST. ROCKFORD, ILL.

STARTED right with the finest nickel alloy steel and made mechanically right by expert saw makers Simonds Band Saws have long been recognized as leaders in woodworking shops. They hold their tension and retain their cutting edge longer.

SIMONDS
BAND SAWS

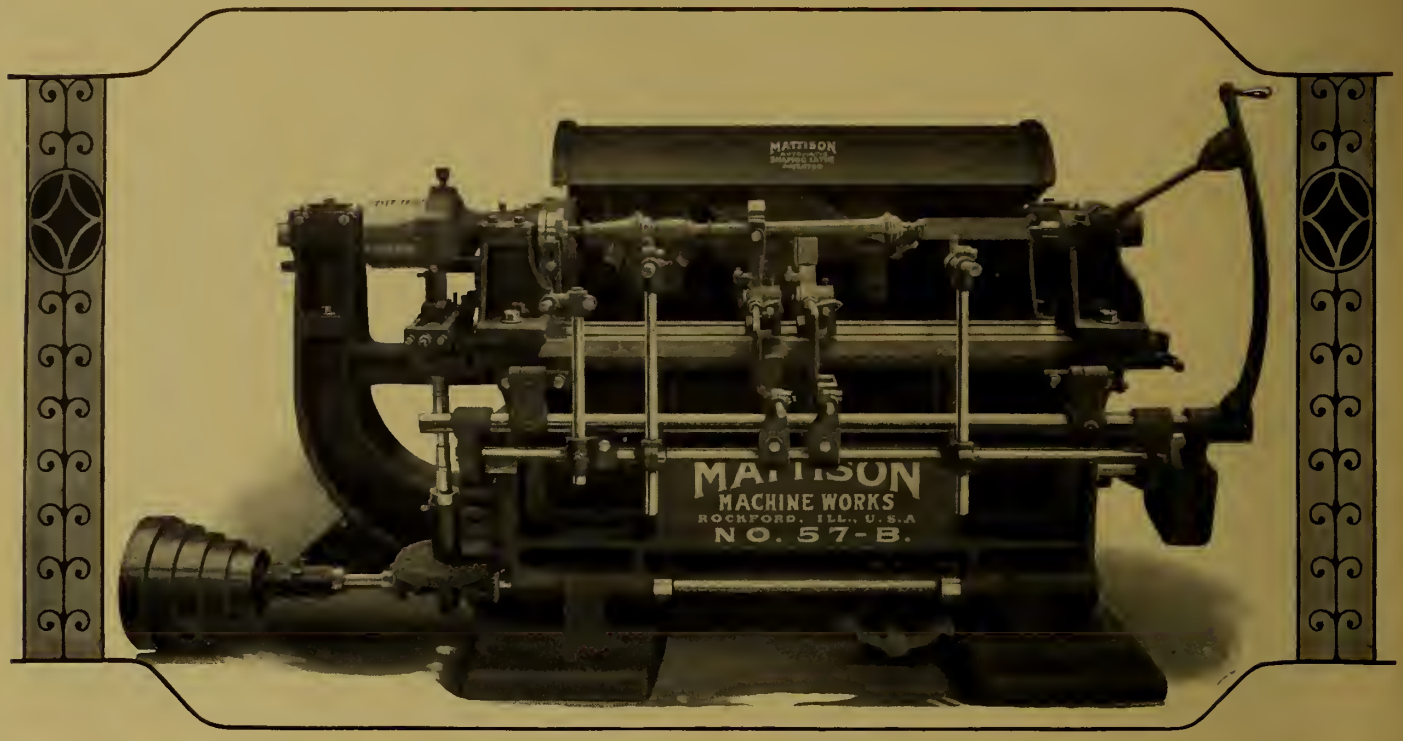


Simonds Canada Saw Co., Ltd.

"The Saw Makers"

St. John, N.B. Montreal, Que. Vancouver, B.C.

MATTISON
Automatic
The Standard Shaping Lathe
OVER 3000 IN USE



New Styles Demand More Turnings

The Mattison Automatic Shaping Lathe produces turnings much faster and cheaper than is possible with hand methods or with old style machine equipment. But of even greater importance is its flexibility which gives your designer free play in creating his designs. It faithfully reproduces all the historic round, square and octagon turned work, which plays so important a part in the new, distinctive patterns of today

If it is worth while to bring out new patterns, isn't it just as important to give equal consideration to the best and most economical method of producing those patterns?

MATTISON
MACHINE WORKS
Rockford, Illinois, U.S.A.

Volume Twenty-One TORONTO, NOVEMBER, 1921 Number Eleven

CANADIAN WOODWORKER and Furniture Manufacturer

NO. 605 IMPROVED SELF-FEED RIP SAW

DIFFERENT? Yes. and not only in the construction, but also in the quality and quantity of its product. 'Tis the latest in Self Feed Rip Saws and is much superior to existing types. We have a circular with full information which we would be pleased to send you without obligation, on request.

CANADA MACHINERY CORPORATION, GALT, ONTARIO
LIMITED

Toronto Sales Office - - 721-2 Bank of Hamilton Building.

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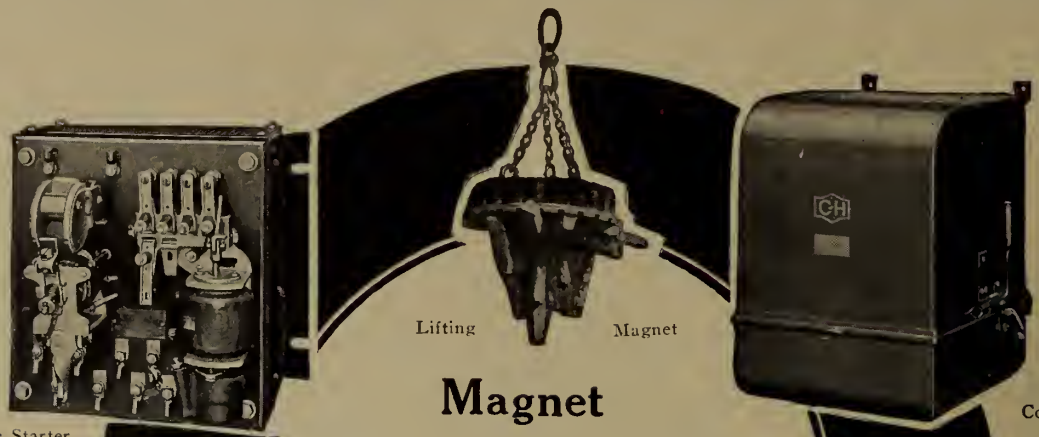
CUTLER-HAMMER



Lifting Magnet

Automatic Starter

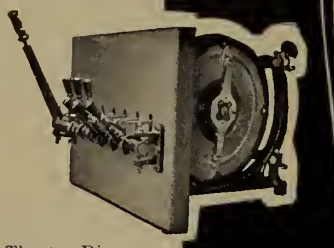
Compensator

Magnet and Control Devices

¶ Cutler-Hammer Lifting Magnets and Magnetic Separators have proved of exceptional value in the mining field, in steel mills and in many other industries for lifting and separating metals. The Magnetic Clutch and electrically operated Brake, used primarily in steel and rubber mills and for crane control respectively, are widely applicable to many industries where the gradual engagement or adequate braking of a load is desirable.

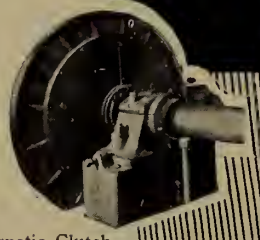
¶ In electric controlling devices of all kinds Cutler-Hammer is the recognized standard of dependability, whether for fine speed adjustment of a machine, extremely close voltage regulation, the wonderful light dimming and colour effects in a modern theatre, or the automatic control of heavy loads or other special operations.

¶ Details and recommendations of suitable Cutler-Hammer apparatus for your control problems are available at our branches



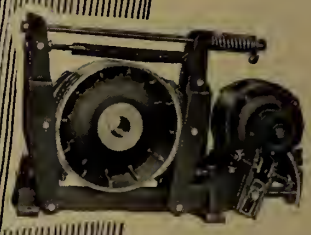
Theatre Dimmer

Drum Controller



Magnetic Clutch

Magnetic Separator



Motor Operated Brake

Northern Electric Company LIMITED

Montreal Quebec Toronto London Regina Edmonton
Halifax Ottawa Hamilton Windsor Winnipeg Calgary Vancouver

D K McLAREN

Wherever a D. K. McLaren Genuine Oak Tanned Leather Belt is in service, there you will find a machine free from all transmission troubles and an owner satisfied he has the best belt money can buy.

It's very simple. In the first place, only the finest hides are selected, and these are tanned by the famous oak process. The result—a perfect belting for all transmission purposes. Strong, non-slipping, stretchless, economical.

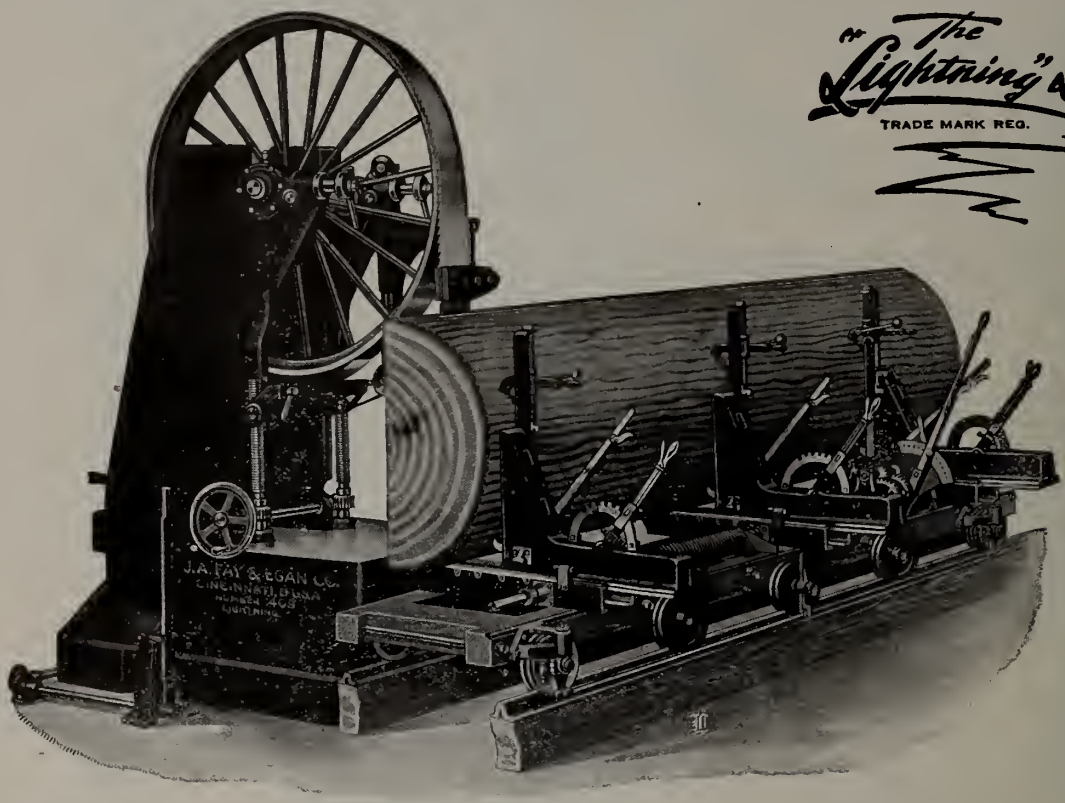
Can you afford to use any other?

D·K·McLAREN
LIMITED

Are You Getting The Maximum Amount of Lumber From Your Logs?

It is a proven fact that a Fay & Egan Band Saw Mill will give you 20 to 25 per cent more merchantable lumber from your logs.

"The Lightning" Line
TRADE MARK REG.



Write for our Band Mill Catalog.

No. 409 "LIGHTNING" Band Saw Mill

The No. 409 will reduce your sawdust pile which is an absolute loss to you—a reduction of your sawdust pile by one forth is real money to you.

Why then continue to use a wasteful circular mill with its big sawdust pile when a Fay & Egan Band Saw Mill will give you more lumber from your logs.

J. A. Fay & Egan Company

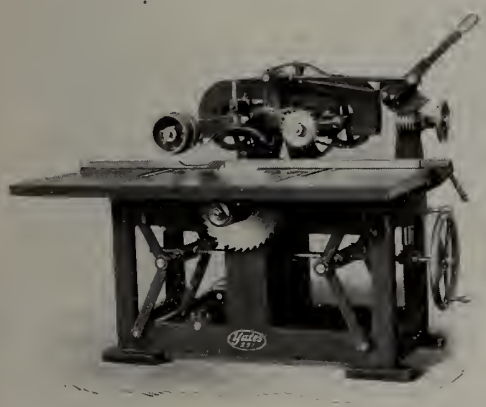
Established 1830

World's Oldest and Largest Manufacturers of Woodworking Machinery

153-173 W. Front St., CINCINNATI, OHIO

LOOK

We make the Smaller Ones



No. 257 Self Feed Rip Saw

No. 225 Saw Table

No. 199 Buzz Planer.

We've had the following remark made to us a number of times lately—"We didn't know that you built small woodworking machines" This set us thinking that no doubt there are a lot of others who don't know that we make the smaller types of Woodworking machines—we certainly do and have made them for a good many years, although we took for granted that the public knew we built them, because we made Woodworking machinery. It's our fault – our heavier machines have had first plaee in our advertising, therefore the public came to the conclusion that we only made the heavier types—no siree, we make the little fellows as well—these shown are but a few, we'll show you more next month.

If you want any information in connection with small machines, or any of the machines shown above, drop us a line we'll gladly send you any data you may require.

P. B. Yates Machine Co. Limited

Hamilton - Canada

Oliver No. 39 Grindstone

There is an "Oliver" Grinder to meet every need of the Woodworker.

Whenever you want a grinder for any part of your plant investigate the "Oliver." If you want a saw sharpener, knife grinder, or tool grinder, we have some good tools to show you.

Oliver Machinery Company
Grand Rapids, Mich., U. S. A.

"Oliver" Straight Wheel Knife Grinder. We also build cupwheel knife grinders for grinding knives from the smallest up to 156 inches in length.

No. 830—30 Inch
Open Back Nailing Machine

YATES

Nailing Machines

Open and Closed Back Types

Made in all Standard Sizes

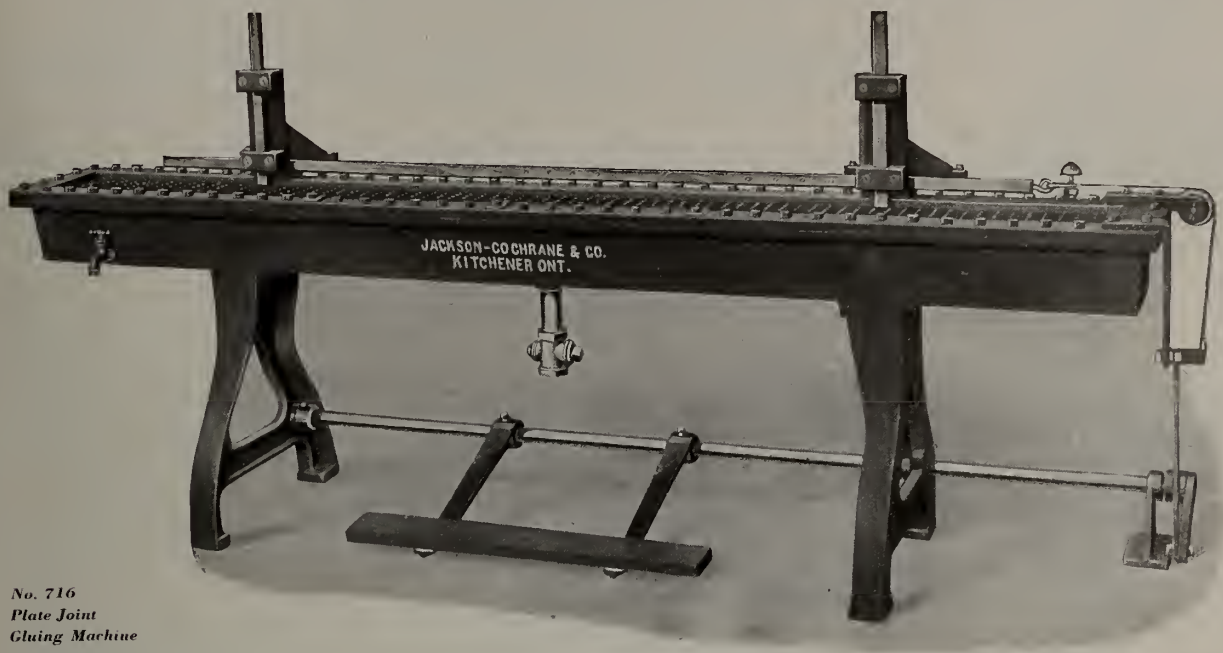
Belt or Direct Motor Drive

We have circulars we will gladly send you upon your request giving full details of these machines

Write Us

P. B. Yates Machine Co. Ltd.
Hamilton Canada

A NEW PLATE JOINT GLUE SPREADER



No. 716
Plate Joint
Gluing Machine

YOU CAN DOUBLE THE PRODUCTION OF YOUR GLUE CLAMPS WITH THIS NEW MACHINE

A thoroughly tested and tried machine that operates easily without waste or mess. It will more than double the production of your clamping equipment. This was proven when it was recently given a thorough trial in one of the largest furniture factories in the Dominion.

The method of operation is simple. The operator presses the foot lever down, forcing the perforated plate up out of the glue. Then by resting the edges of the stock on the plate and moving them backward or forward about one inch, the edges resting on the plate will be instantly and completely spread with glue. On releasing the foot lever the plate is lowered into the glue ready for the next batch of stock.

The tank is 5″ wide and 5″ deep.
Perforated plate is 4″ wide, ⅜″ thick and 1″ shorter than tank.

Size	Floor Space	Weight
5′ 11″	7′x2′	700
7′ 11″	9′x2′	800

Descriptive Circular sent on request

JACKSON, COCHRANE & CO., KITCHENER, ONT.

Greater Profits when You use this Machine

Drives machine screws wood screws, stove bolts, hex.head or square head bolts, or most anything that can be magazined.

No matter what the production of your plant is, if you are driving screws in quantity this this machine will reduce your labor costs and bring you greater profits.

The Reynolds Magazine-Fed screw Driving Machine is used and recommended in hundreds of plants throughout the woodworking industry.

Are you interested? If so, write giving dimensions, gauge and length fo screw.

The Reynolds Machine Co.

Department C

Massillon, Ohio, U. S. A.

P. L. Robertson Mfg. Co., Ltd.

Milton - Ontario

To the manufacturer of furniture nothing could be more logical than the use of the Robertson Patented Socket Head Wood Screws.

It matters little whether the screws are driven by hand or machine, the saving in time and labor is the same. And, of course, with this screw the work is much neater, for the driver never sleps out, consequently scratches and other disfiguring marks are eliminated.

Used by Canada's largest manufacturers.

Write us for samples, prices and full details,

Drivers Supplied Free With First Order.

D. McKENZIE MACHINERY COMPANY

GUELPH :: ONTARIO

This cross-cut mitre and rip saw is an accurate, rapid and easily operated machine of wonderful value on light work and embodying all the requirements and attachments for general work.

Tilting table or boring attachment may be added at any time.

Our pamphlet describing the various features is yours for the asking. Send for it today.

Prices and Full Details on Request

Split Tilting Table

This illustration shows the machine equipped with a Split Tilting Table (Patent applied for) and a boring attachment. The Split Table can be tilted and locked at any angle up to forty-five degrees as indicated on the graduated segment. This table is very rigid and accurate.

We specialize in 16 in. Back Geared Crank Shaper, 14 in. x 6 ft. or 8 ft. Engine Lathes, Bench and Pedestal Grinders, Power Hack Saw Machines, Bench and Column Sensitive Drills and Saw Tables.

"A Good Name is Better Than Great Riches"

"PROFIT" IS NOT the idea of FIRST IMPORTANCE in our building machinery. "SERVICE AND SATISFACTION TO THE CUSTOMER" IS the idea of FIRST IMPORTANCE, and to assure this, it is necessary that we

Give the Best We Have AND Put the Best We've Got INTO Our Work:—Your Machines.

OUR REWARD—

Slowly but Surely we are getting the reputation about the country of being **a dependable firm,** supplying only **the very best** and **the most reliable** woodworking machinery and standing behind it "for better or for worse."

If you know any good about us, **tell your friends,** and if you don't know anything about us, **ask your friends,** but be sure to talk about us, and——give us a chance when next you need anything in our line **WELL DONE.**

The Preston Woodworking

PRESTON,

We are Sole Manufacturers and Agents in Canada of the Eaglesfield Patented Beltless Swing Saw.

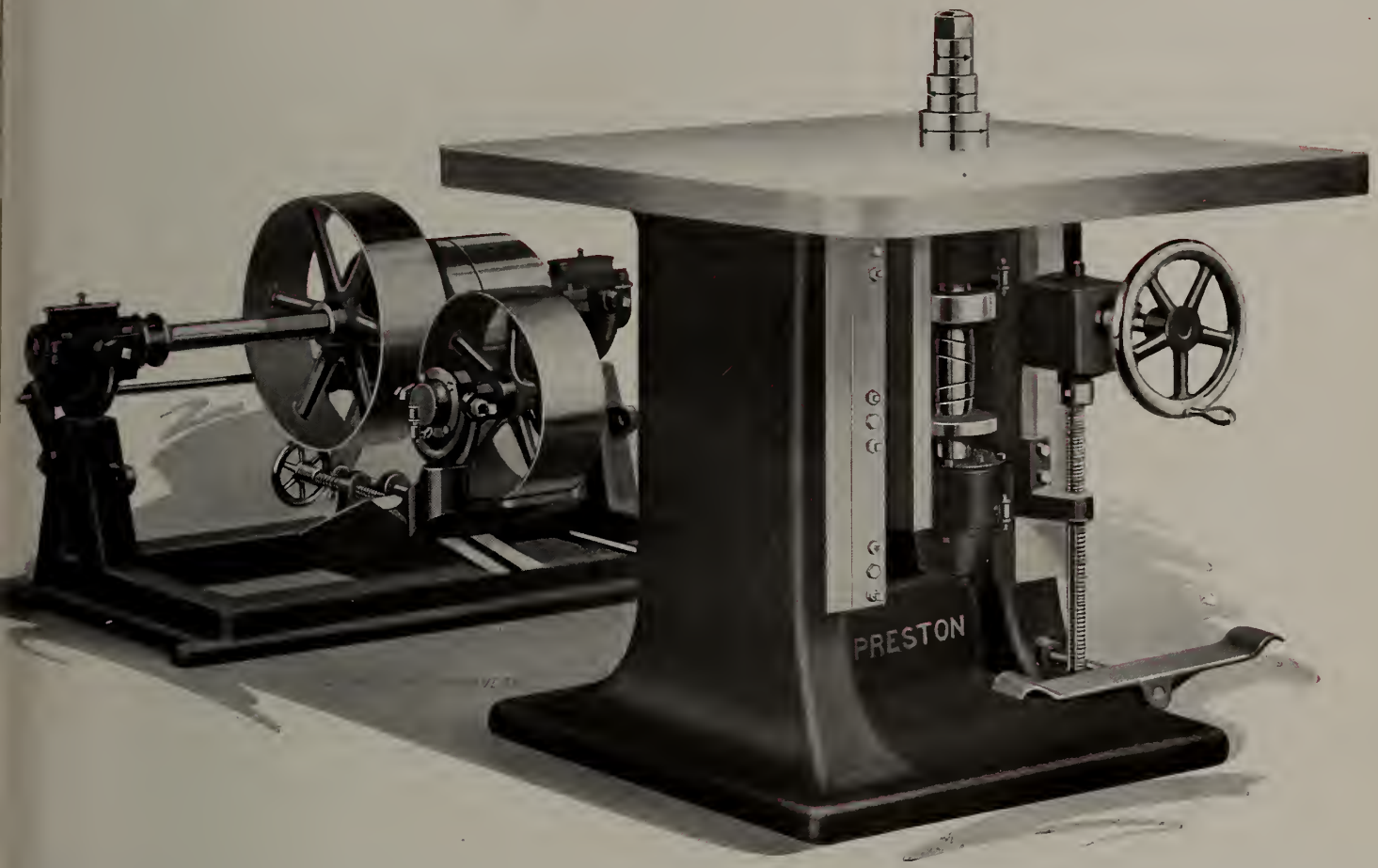
You can Double your Shaper Output

with one of our No. 162

HEAVY HIGH-SPEED BALL-BEARING SHAPERS

and you can also

Improve the Quality of Your Work



May we have a chance to prove this strong statement to you when you need a Shaper?

We have specialized in Ball Bearing Shapers for twelve years and offer you a machine having every known and modern improvement. We will gladly furnish you with the names of a hundred users as proof of our claims.

PREDOMINANT FEATURES—Spindle speeds, 7,000 to 12,000 r. p. m. Specially selected S. K. F. Ball Bearings. Built with either one or two spindles. Weight Double Spindle 2850 lbs. Single Spindle 2000 lbs.

Machinery Company, Ltd.

ONTARIO

Specialists in Ball Bearing Woodworking Machinery

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GOOD VALUES

51602.—Used 36" Andrews 4 spindle vertical boring machine, adj. to 2¾ centers.
G. 1.—60" Berlin, 3 drum Sander, drums are straight and the feed rolls are raised and lowered by hand, used.
Q. 1.—Practically new Berlin, 30", 3 drum Sander, variable feed.
48850.—Berlin Royal Invincible three drum Sander, with power raising rolls, spiral drums and variable feed used.
50837.—No. 7 McGregor Gourlay, 54" Band Re-Saw, cuts 6" on one side, and 3½" on the other, resaws, 20" wide, used.
50958.—No. 4½ 30" American Sectional Roll Cabinet Planer, used. with sectional feed rools and sectional chip-breaker.
2323. —No. 107 Crescent Woodworker, new, consisting of 26" band saw, 12" jointer, rip and cross-cut saw table, reversible shaper, boring attachment and all belts.
51181.—Yates Type 2-G Straight Edge Ripper, 10" saw, with revolving bed, used.
51248.—Fay and Egan No. 112 "Lightning" Flooring Planer, to plane and match 6" wide, 4" thick, 8 feed rolls, used. Will run stock at 100 feet per minute.
51394.—C.M.C. Dowel Machine, No. 927, with three heads, used.
50892.—No. 129 Preston power feed rip saw, 22" saw, cutting 7¼" stock, used.
48627.—Morgan Boxboard Matcher, feed 130 feet per min. long and short boards, as short as 5", used.
50775.—Preston High Speed Ballbearing Shapers, new and used.
51132.—New No. 430 C.M.C. Suspension type Lucas Belt Sander.
50602.—Used Goldie & McCulloch S. F. Rip Saw.
61535.—New Beach 6 stop Box Makers' Cut-Off Saw, 6 ft. carriage.
51302.—C.M.C. 638 Lightning Cut-Off Saws, without gauges, used.

The Prices are Right.

The A. R. Williams Machinery Co. Limited

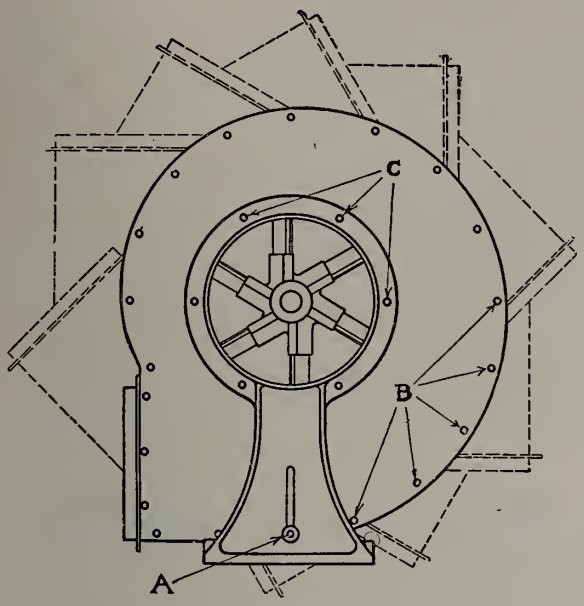
64 FRONT ST. WEST - TORONTO

Phone Woodworking Machinery Dept., Adelaide 20

Full lines of Iron and Wood-Working Machinery, Boilers, Engines and Contractors' Machinery, Electric Motors, Saws, Shingle and Lath Mill Machinery, etc.

HALIFAX, N.S. ST. JOHN, N.B. MONTREAL, P.Q. TORONTO, ONT.
VANCOUVER, B.C. WINNIPEG, MAN.

Canadian Mill Exhausters



One of the features of the Canadian Planing Mill Exhauster is the reversible housing. It is easily adjustable to either hand and to any discharge.

By this arrangement one fan may be used to meet all requirements, thus eliminating crossed belts and sharp angles.

Let our engineering department help you plan your refuse exhauster system.

Write for catalogue 400-13.

Canadian Blower & Forge Co.
KITCHENER, ONT.

CAULS

¶ There are many advantages to be gained in Veneer Pressing by the use of

ALUMINIUM

Cauls. They retain the heat half as long again as zinc, are only one-third the weight and are easy to clean. The low first cost is also worthy of consideration. Write now for further information and prices.

The
British Aluminium Co.
Limited

263-267 Adelaide St. West
TORONTO.

Eastern Agents:
Spielman Agencies, Regd., Montreal.

The Shimer Round Safety Cylinder with High Speed Knives

A Round Safety Cylinder that will Appeal to the Buyer and the User for three Reasons:

The first is our adjusting nut for setting the knives. It is the only cylinder with properly located adjusting nuts for setting the knives, which, with our way, can be set to 1-1000 of an inch.

The second is our way of holding the knife without tapping into the head.

The third is the correct angle of cut for the knives.

Made for Any of the Different Makers' Machines and in Any Length Cylinder.

WRITE FOR PRICES

SHIMER CUTTER HEAD CO. OF CANADA, LIMITED

Manufacturers of Cutter Heads, Safety Cylinders and Grinders

GALT, ONTARIO

The Mereen-Johnson Resaw

has many features of advantage which place it far ahead of anything in the Resaw field.

No pulleys—no belts—no frictions.

The sprocket and chain arrangement for changing speeds is only one of the many improvements on this machine.

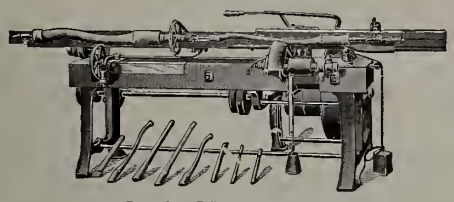
Write for circular.

Mereen-Johnson Machine Co.

Minneapolis Minnesota, U.S.A.

Klotz Machine Co's
Handle Machinery

Used Wherever Handles Are Made



42-Inch Handle Lathe

Lathes for turning Ax, Adz, Hammer, Hatchet, Picsk, Sledge Handles, etc., and for turning other irregular articles. We also make Wine Maker's Machinery, Shafting, Pulleys, Hangers, etc.

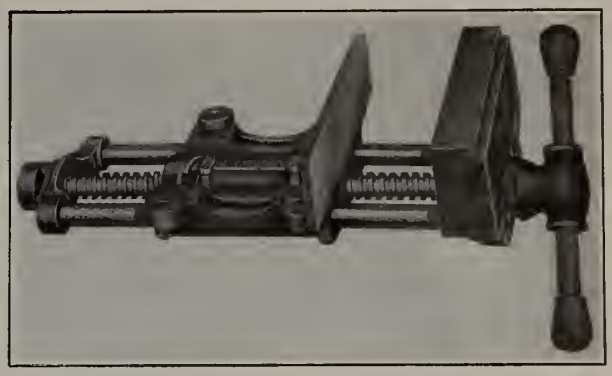
Bolting, Blocking, Shaping and Cut-off Saw Machines, Handle Knobbers, End Shapers, Polishers and Throate

MANUFACTURED BY

Klotz Machine Co.,
Sandusky, O., U. S. A.

Write for descriptive circulars and prices.

The Vise You Swear BY not AT



On the Market for 15 years.

Globe Vise & Truck Co.

GRAND RAPIDS, MICH.

We also manufacture a complete line of steel trucks particularly for wood working factories. The body of our truck is absolutely indestructible, and there are no nails nor screws in the top to mar material, whether finished or unfinished. The roller bearing feature in the wheels allows for much easier handling than the old style plain wheels on the wood truck. In fact one man can handle much more material than on the old style. The price is very little more than that of the old style wood trucks.

SCROLL SAW 315

1600 R. P. M.

The Highest Speed, Fastest Cutting, Most Economical, Easiest Operated, Most Satisfactory All-Round Machine of this kind.

—Entirely self-contained
—No springs or top tension
—Back guide swings back
—No saw to uncouple
—Work changed without stopping machine

Full particulars and price of this or other WOODWORKING MACHINERY *on application.*

Cowan Company of Galt, Ltd.

GALT, ONTARIO, CANADA.

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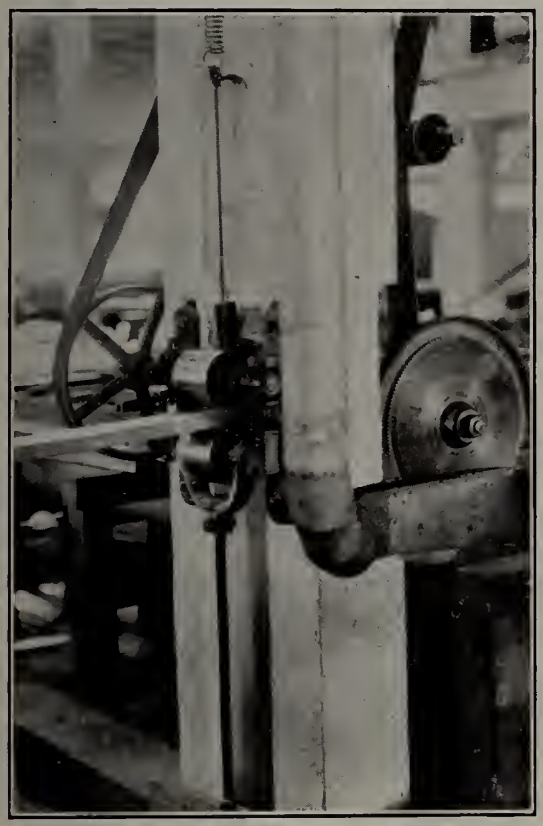
If made of hide for mechanical purposes we have it

A Real Trimmer



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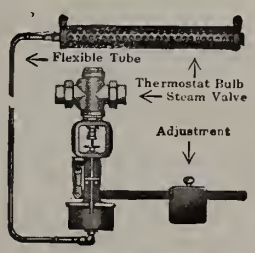
In the glue kettle, the varnish drying room, the dry kiln—wherever there is a need for maintaining a definite, even temperature, the Powers Automatic Heat regulators give "100 percent perfect" results. They are always on the job—accurate, sure, reliable. They prevent overheated glue, checked or case-hardened lumber, crazed varnish—all the errors that are so apt to creep in with manual control.



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Entirely self-contained. Peculiarly adapted for control of drying room, kiln, etc.

Other Powers Regulators for other places. Ask for details.

We shall be glad to give you the benefit of our more than thirty years experience in temperature regulation, and if you will tell us where you would like to try out a Powers Regulator, we will send the right one for thirty days' trial. If you don't find it satisfactory, send it back.

THE CANADIAN POWERS REGULATOR CO., Limited

— Specialists in — Automatic Heat Control

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THE COLD WATER GLUE
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LACTOCOL is used extensively in Canada in the mass production of joinery work.

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A Few Recent Testimonials

UNION FOUNDRY AND MACHINE WORKS, Limited
(Successors to Allan's Foundry)
Office: 909 Duke Street
Saint John, West, N.B., Aug 2nd, 1921.

Holloway, Randell & Co., Ltd.,
Halifax, N.S.

Gentlemen,—

Your favor July 30th to hand. We received tin of glue and have found it to give the best satisfaction we have had yet.

We are now glueing up a large friction and will let you know later how everything turns out.

Yours very truly,
THE UNION FOUNDRY & MACHINE WORKS, Limited,
Per M. E.

SAINT JOHN IRON WORKS (Limited)
Office and Works: Vulcan Street
Marine and Mill Machinery, Boilers, Tanks, etc.,
Iron and Brass Castings.
Saint John, N.B., August 3rd, 1921.

Messrs. Holloway, Randell & Company, Limited,
Halifax, N.S.

Gentlemen,—

Replying to yours of August 1st, we beg to report that we have tested the Lactocol Glue and find it stands up to all tests very satisfactorily. It seems to us that this is the best thing in this line that we have yet had.

Yours very truly,
SAINT JOHN IRON WORKS, LIMITED
HPJ/VMF H. P. Jenkins, Manager.

D. G. KIRK WOODWORKING AND CONTRACTING CO.
ANTIGONISH, N.S., Aug. 3, 1921.

Holloway, Randell & Co., Ltd.,
Halifax, N.S.

Dear Sirs,—

Your favor of July 30th to hand, asking if we found Lactocol Cold Water Glue satisfactory. In reply, we may say that it is perfectly satisfactory. We soaked a glued piece of Douglas Fir for forty-eight hours and we were unable to take it apart.

Yours very truly,
D. G. KIRK WOODWORKING CO. RHD/MD

CHAPPELLS LIMITED
Wood Workers and Builders
SYDNEY, N.S., Aug. 1, 1921.

Messrs. Holloway, Randell & Co., Ltd.,
Halifax, N.S.

Dear Sirs,—

Replying to your communication of July 29th, would say that we have tested out Lactocol Cold Water Glue and up to the present are entirely satisfied with results in connection with its adhesive qualities. Another feature which Lactocol has is its price, which we find compares favorably with the ordinary glue on the market; the initial cost is a little more, but on account of its economic quality, we find it is cheaper in the long run.

Yours truly,
CHAPPELLS LIMITED
Per M. R. Chappell.

MRC/M

THE DOUGLASS FULLERTON COMPANY
Limited
Iron Founders and General Machinists
Pattern Work a Specialty
DARTMOUTH, N.S., June 20th, 1921.

Messrs. Holloway, Randell & Co.,
Halifax, N.S.

Gentlemen,—

We have given your Lactocol Cold Water Glue some very severe tests, namely, joining two pieces of teak, which, owing to its oily nature, makes it almost impossible to join satisfactorily with ordinary glue; also we joined a piece of hemlock to white birch, which withstood heavy hammer blows, and after being submerged in sea water for over 12 hours, still clung together as tight as ever.

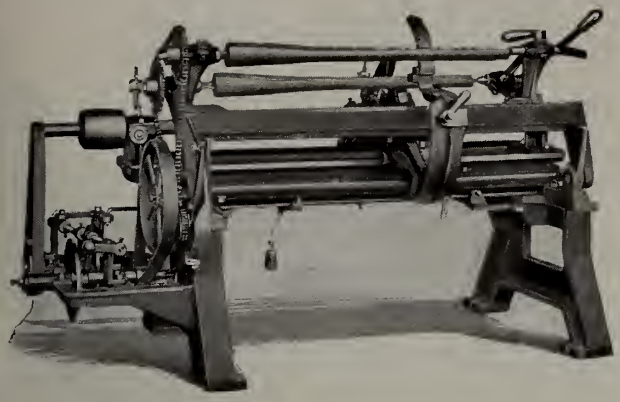
We, after making these tests, highly recommend this glue for any kind of woodwork.

Yours very truly,
THE DOUGLASS FULLERTON CO., LTD.
Per H. B. Douglass.

HBD/AJD

Your enquiries solicited.

HOLLOWAY RANDELL & CO. LTD. Sole Canadian Distributors **HALIFAX, N.S.**



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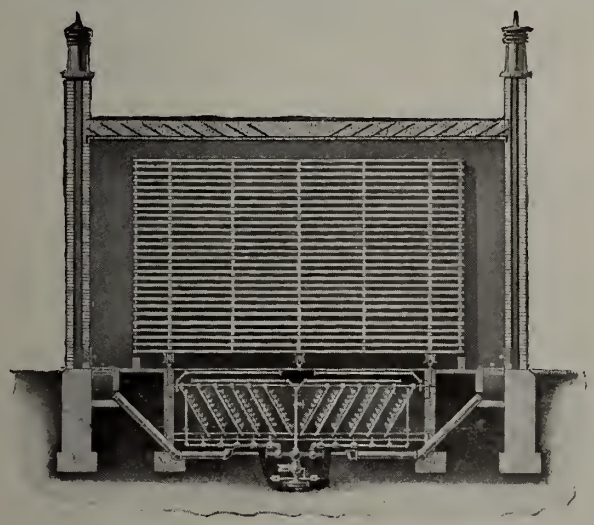

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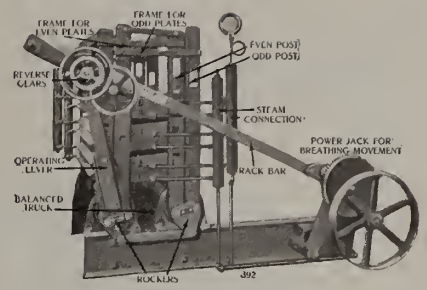


Bulletin No. 70-C W

MESCO

This is the Machine

Referred to in an article on page 90 of the October issue of this paper, entitled

Development in Veneering Practice

We quote one paragraph as follows:

"There is one type of re-drier which has been constructed specially for handling veneers and cross-banding. It is known as a hot-plate redrier. The principle is that the veneers are placed between hot plates which are brought together, straightening and drying the veneers at one time. The plates are so actuated that they come together and separate again in a breathing or bellows-like movement. When under pressure the stock is straightened and heated, then when the plates separate momentarily, the vapor formed has a chance to escape and the stock is given an opportunity to shrink. This alternate opening and closing goes on until the stock is dry. If the pressure were to be applied and kept on, the moisture would not be able to escape so readily, and as the stock would be held between two flat surfaces, shrinking would be resisted, with the result that checks would appear. The hot plate type of redrier is in operation in many plants and seems to be the logical equipment for this work."

MERRITT ENGINEERING AND SALES COMPANY LOCKPORT N.Y.

It pays to install a "Merit" Re-drier

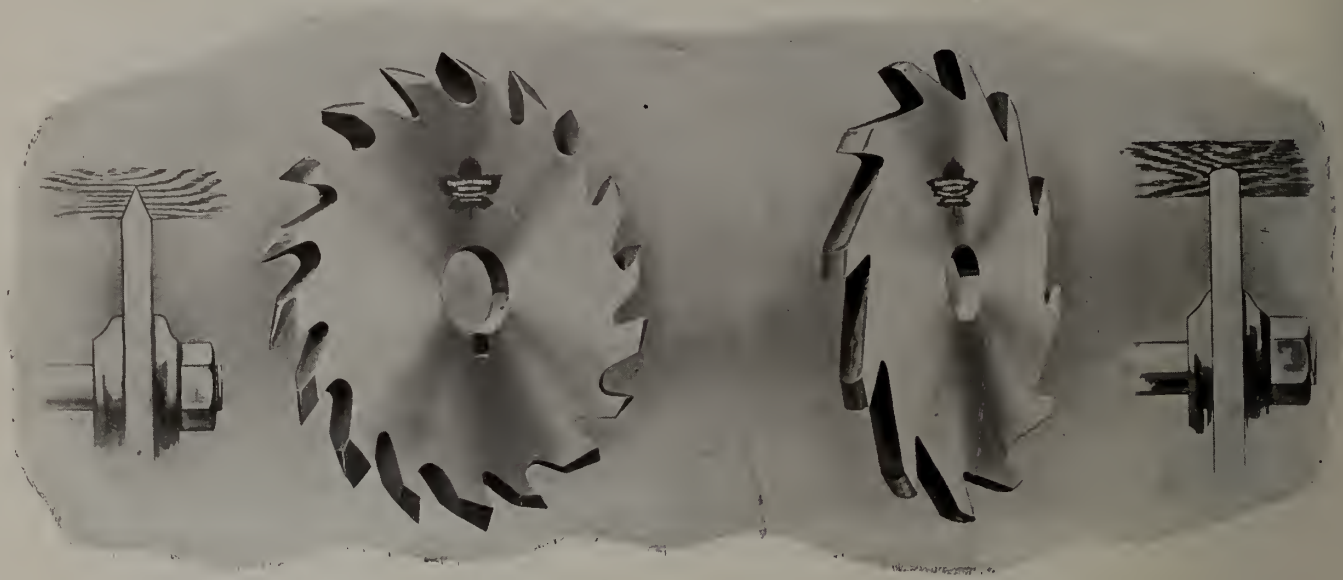
The "MERIT" Re-Drier

for veneer

is but one application of the "MERIT" HOT PLATE SYSTEM to the drying of thin wood, pulp board, asbestos board, and other material in flat or sheet form.

MERIT

MAPLE LEAF SAWS



Maple Leaf Saws will give you just that steady, day-in-day-out service that means so much in your plant. They are made with this object in view. The whole process of their manufacture, from the selection of the highest grade steel to the time they leave our hands is attended to with the greatest care.

The complete line includes Bands, all kinds of Special Saws for Special Work, Cross-cut Saws, Gang Saws, Dado Heads, etc. Every one guaranteed to merit your approval.

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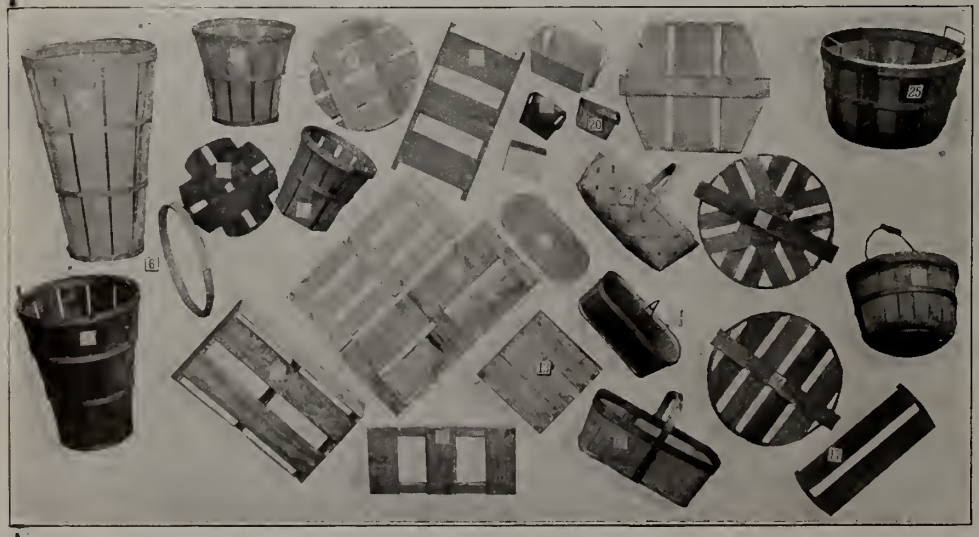

of the Machinery for the Rapid Production of

Veneer—Crates—
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Get the name fixed in your mind.

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The Oil Stone Grinder

is the most modern tool for sharpening edge tools, machine knives, chisels, gouges, plane bits, etc. The Oliver Oilstone Grinder illustrated is installed in the Pattern Shop of the City Pattern Works, Detroit. It is equipped with two large oilstone wheels, one intended for rapid abrasion, the other for putting the smooth, keen edge on the tool. An emery cone for grinding gouges is located at one end of lower arbor with 10-inch general grinding wheel on opposite end Machine shown is equipped with a Knife Grinding Attachment. The Oilstone Grinder is exceptionally well guarded—a characteristic of all Oliver Machines.

The Oliver Line includes such grinding machines as Grindstones, Tool Grinders, Oilstone Grinders, Knife Grinders, Saw Grinders, Wood Grinders.

Put your equipment problems up to the Oliver Engineers who have specialized in Woodworking Machinery and Machine Tools.

OLIVER MACHINERY COMPANY
GRAND RAPIDS, MICH.

Speed + Perfect Joints = Low Costs

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CLAMP CARRIER

for

Small Jobs in the Big Plant
All Jobs in the Little Plant

1. Natural standing position of operator.
2. No Juggling of heavy clamps.
3. No bending or walking.
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5. Less space than equal number of clamps with work in, piled on the floor.

Any size to suit your work. 8 and 12-section wheel type. 16, 20, 30 and 40-section chain type. 4, 5 or 6 clamps per section for stock up to 42-in. wide.

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NASHUA Veneer Tapes

Are manufactured with a view to giving the consumer the material for his purpose, and we stand ready to develop any special requirement for you.

In purchasing our tapes you are assured of prompt **service**, guaranteed **quality** and a reasonable **price.**

Samples of our stock will be sent upon request, so that you may try them out in your plant in a practical way.

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TROY SEALING TAPES

Troy "Magic" Plywood Tape

Will simplify and increase your production without increasing cost.

Its use entirely eliminates the slow, tedious process of sanding and scraping.

You simply moisten and apply Troy "Magic" as you would any tape.

The difference is in the removal of it, which requires but a few moments soaking and one quick jerk.

The whole strip peels off in one piece—easily, quickly, leaving the surface smooth and clean beneath. No sanding, no scraping necessary.

Let us send you samples for a test. We furnish Troy Magic Plywood Tape in paper or cloth, any width or weight, and guarantee every inch of it.

The
Gummed Products Co.
Troy **Ohio**

Perkins Vegetable Glue

is applied cold and will not congeal in cold weather—
a fact to bear in mind at this season of the year.

The Picture Shows The Present Home of

PERKINS 183

TRADE MARK (Reg. U.S. Pat. Off.)

Built up to a Quality Not Down to a Price

Process and Product Patents covering Perkins Glue were granted July 2nd and March 19th, 1912, and have been held valid and infringed by the United States Circuit Court of Appeals Patents have also been granted in Canada, Great Britain, Germany, France, Belgium, Italy and other foreign countries.

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Factory and General Offices:
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Chestnut Gum Poplar Crossbanding—Center Stock

ROTARY CUT **POPLAR and GUM** VENEERS

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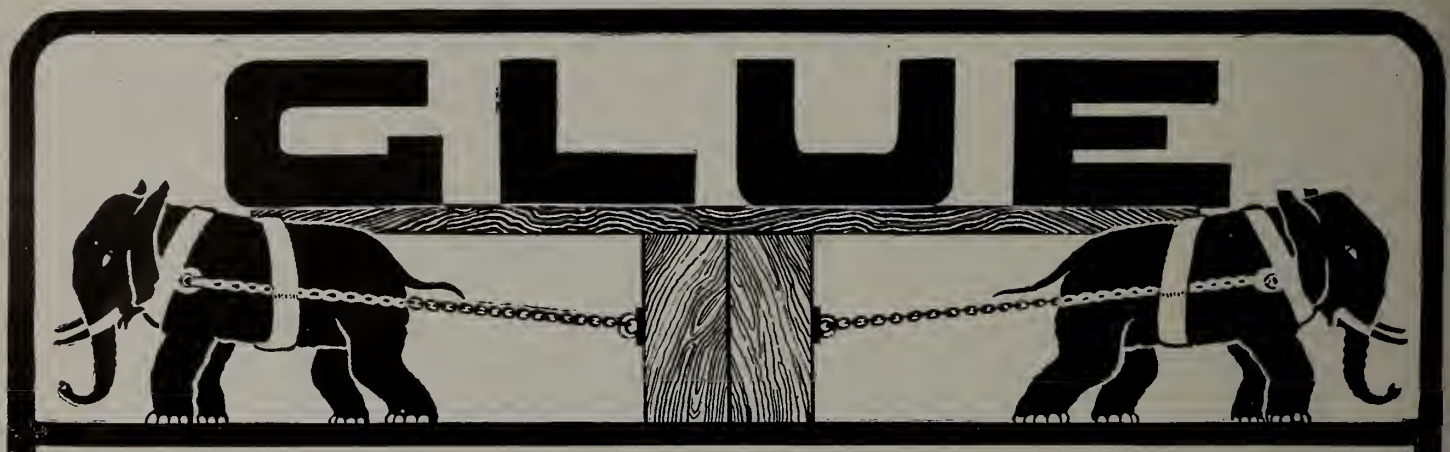

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Great Strength & Light Colour.

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Regular size 24 x 48.
Stakes 30 inches high.
Centre wheels 14½ in., diam., 2 in. face.
Steel stem castor wheel 6 1/4 in. dia., 1 1/4 in. face.
Weight 160 lbs.
Special sizes to order.

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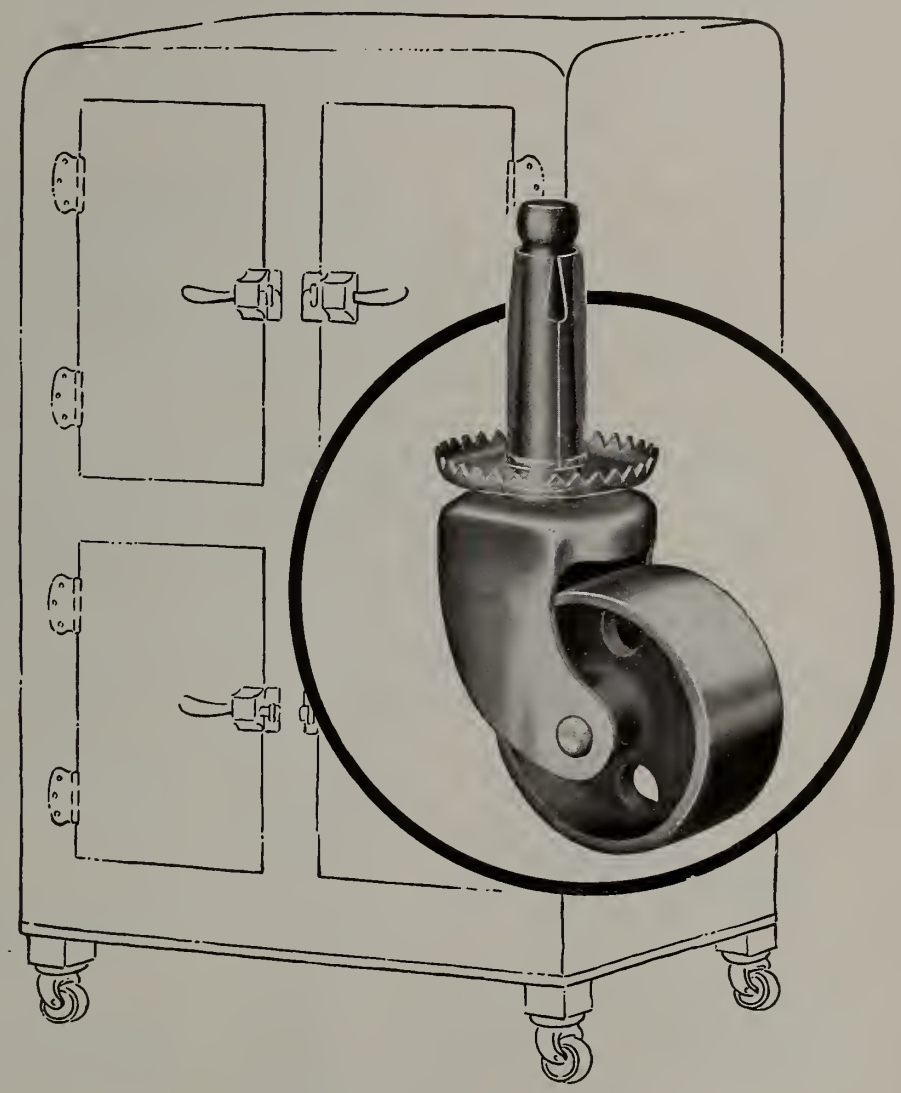
Refrigerators Call For Casters of Endurance

Probably there is as much caster trouble in connection with refrigerators as is found anywhere.

These heavy pieces when equipped with a well selected set of smooth-running casters make distinctly satisfactory merchandise to handle.

A sturdy, heavy duty **Efemco** Caster obviates all the later bother and avoids criticism.



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A Caster for every need is listed.

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"CASCO" uniformity is assured because we manufacture our own Casein.

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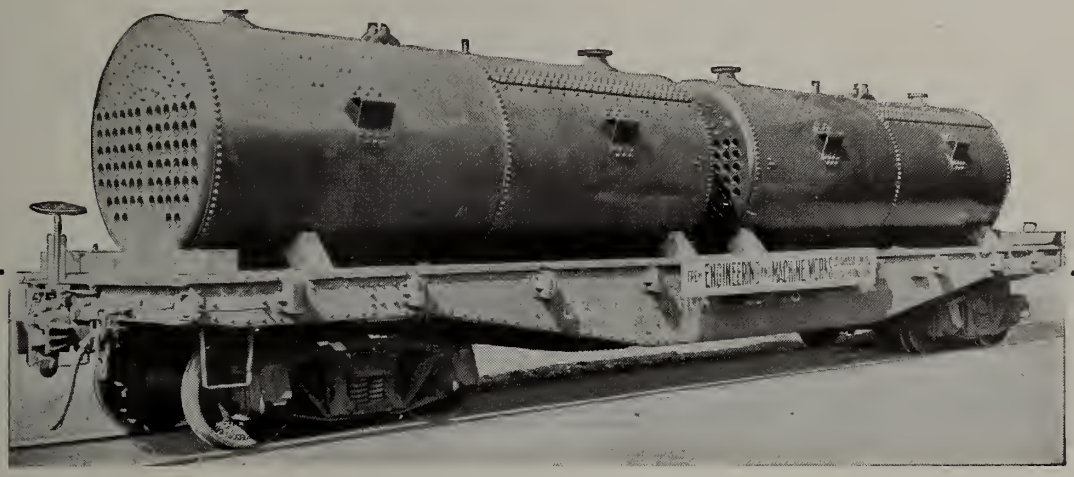
The heating system is uniformly spread

under all the lumber
in

THE STANDARD Dry Kiln

This important point is discussed in our literature. For copy address: The Standard Dry Kiln Co., 1542 McCarty St., Indianapolis.



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Now that prices are stabilized in this business, as we feel certain they are, we urge upon you that you provide that new Boiler you need now. Boilers take time to make and you want yours before everyone is crowding into the market at once. We build all types, for all duties, and our standards are high.

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The Hand-Hole Machine will cut hand holes in crate and box ends. It is worked by a carriage and levers, and will cut any size or length hole with either round or bevel edge in any kind of wood.

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Can We Serve You, too?

Try a straight or mixed carload of the following:—Soft Oak, Plain and Quartered, Poplar, Walnut, Chestnut or Ask.

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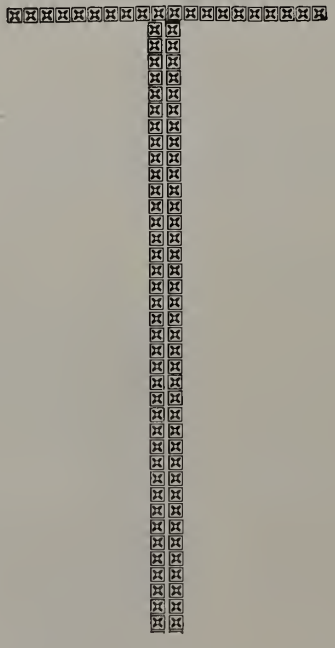

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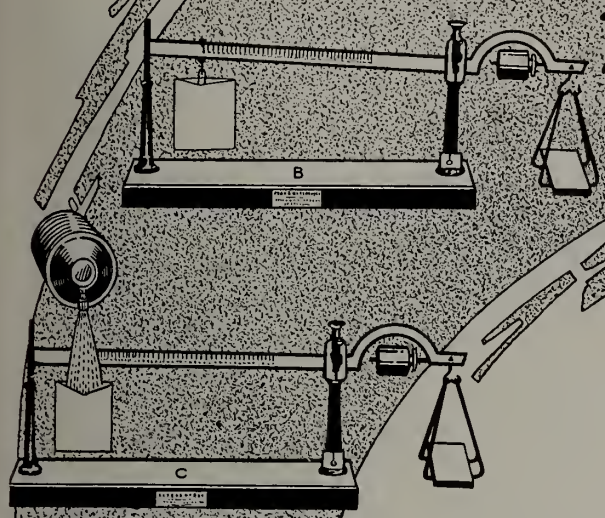
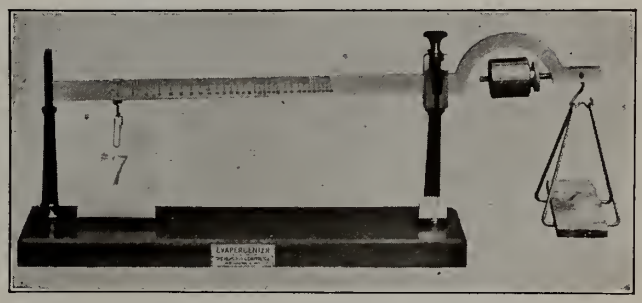
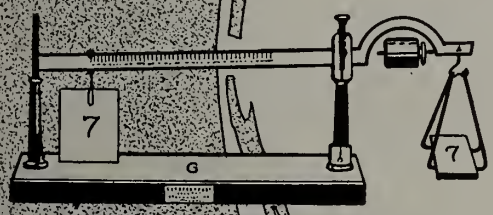
Philadelphia - Pennsylvania

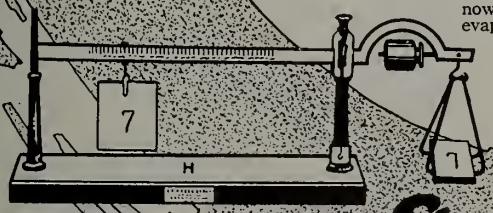
Evapercenter

for Finding Moisture Content









Method of Procedure

A. Hang clip with envelope on scale bar at "0."
B. Place test piece on scale.
C. Fill envelope until scale balances.
D. Detach envelope and mark both test piece and envelope with identifying number.
E. Repeat foregoing operations with any number of test pieces as desired.
F. Bake test pieces on heater or in oven until they are bone dry.
G. When bone dry, place test piece on scale, select envelope with same number and hang it in place.
H. Move slide with envelope until scale balances. Scale now indicates percentage evaporated.

Something New and Practical

The EVAPERCENTER determines moisture content without actual weight being known—percentage is based on the bone dry weight only; no tables to refer to, no calculations to make.

Samples can be of any gross weight, and large and varied in size.

The EVAPERCENTER will operate on any nominally level surface.

PRICE: Evapercenter
Counter Weight Material
Container
One Hundred Envelopes
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is consistent with the demands of the heaviest Chesterfield.

They will stand the roughest usage, and will add to the attractiveness of your goods. Last but not least they are reasonable in price.

J. WALTER & SONS LIMITED

KITCHENER :-: ONTARIO

British Columbia Forest Products

Technical Information

Information furnished as to the qualities, weights, strengths, and uses of all woods

INQUIRIES SOLICITED

Samples of all British Columbia woods and literature for distribution

CALL AND SEE OUR EXHIBIT

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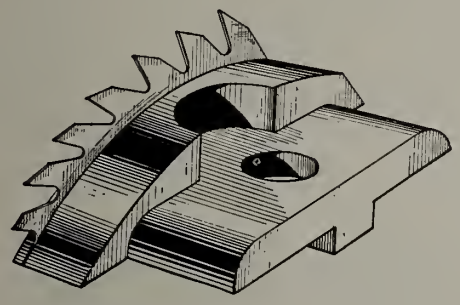
(Street Floor)

Telephone Main 6872. **Note: We do not quote prices.**

The Shuff Sticker Saw Head Attachment



Canadian Patent No 212337

This attachment will double your moulder production, widening its range of performance and effecting a real saving in the running of pully stiles, blind stops, cove, parting stops, window stops, fillet, glass bead, base moulding, ceiling, lattice moulding, screen moulding, base shoe, quarter round, stools, panel moulding, etc. Used for splitting moulding when two or more are run at the same time, a decided improvement over the flat knives for this purpose ; also used or rabbeting and grooving.

The attachments are furnished in pairs of rights and lefts, are made of solid brass, each pair properly balanced and saws sharpened and set before shipment. Made in all sizes to fit any moulder. When ordering send sketch of end view of sticker head. Cut smooth and are easily set up. Price $30, 00 in American funds f.o.b. Waukesha, Wis.

Manufactured by

JOHN SHUFF P.O. Box 45, 145 Barstow St. Waukesha, Wis.

American Hardwood Lumber Co.

St. Louis, Mo.

Large stock of—

Dry Ash, Quartered Oak Plain Oak and Gum

Shipments from — NASHVILLE, Tenn., NEW ORLEANS, La., and BENTON, Ark.

DRY STOCK

For Immediate Shipment

SOFT ELM		**SOFT MAPLE**	
6905′	1″ —No. 1 C&B	14397′	2½″—No. 1 C&B
3195′	1″ —No. 2 Com.	**BASSWOOD**	
41030′	1¼″—No. 1 C&B	1549′	1″ —No. 1 C&B
2356′	1¼″—No. 2 Com.	606′	2″ —No. 1 C&B
56880′	2″ —No. 1 C&B	**BUTTERNUT**	
10046′	2″ —No. 2 Com.	2584′	1″ —No. 1 C&B
110594′	2½″—No. 1 C&B	**HARD MAPLE**	
26985′	2½″—No. 2 Com.	31788′	1″ —No. 1 C&B
11750′	3″ —No. 2 Com.	243927′	1¼″—No. 1 C&B
WHITE ASH		227707′	1½″—No. 1 C&B
87846′	2″ —No. 1 C&B	1796′	1½″—No. 2 Com.
3072′	2″ —No. 2 Com.	217401′	2″ —No. 1 C&B
139960′	2½″—No. 1 C&B	11410′	2″ —No. 2 Com.
13537′	2½″—No. 2 Com.	38016′	2½″—No. 1 C&B
18992′	3″ —No. 1 C&B	11091′	3″ —No. 1 C&B
608′	3″ —No. 2 Com.	2796′	4″ —No. 1 C&B
HICKORY		**BEECH**	
650′	1″ —No. 1 C&B	3000′	1½″—No. 2 Com.
1408′	2″ —No. 1 C&B	500′	2″ —Log run
COTTONWOOD		250′	2½″—Log run
1620′	1″ —No. 1 C&B	350′	3″ —Log Run
19956′	2″ —No. 1 C&B	100′	4″ —Log run
1196′	2″ —No. 2 Com.	**BIRCH**	
BLACK WALNUT		15998′	1″ —No. 1 C&B
2873′	1″ —No. 1 C&B	22311′	1½″—No. 1 C&B
1151′	1″ —No. 2 Com.	11748′	1½″—No. 1 C&B
WILLOW		50157′	2″ —No. 1 C&B
1446′	1″ —No. 1 C&B	87172′	2½″—No. 1 C&B
CHERRY		7866′	3″ —No. 1 C&B
4747′	1″ —No. 1 C&B	**PLAIN OAK**	
2137′	1″ —No. 2 Com.	9369′	1″ —No. 1 C&B
ROCK ELM		1107′	2″ —No. 1 C&B
12493′	2″ —No. 1 C&B		

The above stock is in our Battlecreek yard and we are so located that we can load and ship stock immediately upon receipt of your orders. We guarantee National Hardwood Lumber Association grades.

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Hardwood and Yellow Pine Lumber

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Hardwood and Yellow Pine for Immediate Shipment from Stock

Complete Stock of Built Up Panels

3 and 5 Ply—Carried in Stock at St. Louis

FIR DRAWER BOTTOMS
FIR DOOR PANELS

Write us for our Stock and Price List

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Specialty—Sawing Dimenison Stock to Order

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Southern Office: MEMPHIS, TENN.
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Plain Red Gum
Quartered Red Gum
Plain Sap Gum
Quartered Sap Gum
Cottonwood, Cypress
Tupelo, Ash, Elm, Oak

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Band Sawn
Hardwood Lumber

Write or wire for prices on
Gum, Oak, Elm, Etc.

We specialize in strictly high grade
SOUTHERN AND NORTHERN HARDWOODS

Your enquiries are respectfully solicited

General Hardwood Lumber Company

118 North La Salle Street, CHICAGO

Our Rule— *Quality Lumber Guarantees Value Received*

E. Sondheimer Co. Memphis, Tenn.

Manufacturers and Exporters of the famous Tensas Basin Red Gum, and other hardwood lumber.

We list below a portion of our stock of thoroughly air-dried, band-sawn hardwoods, and solicit your inquiries by mail or wire.

PLAIN RED GUM

100M ft.....5/8 1s & 2s
50M ft.....5/8 No. 1 Com.
75M ft.....3/4 No. 1 Com.
50M ft.....4/4 1s & 2s
50M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.

QUARTERED RED GUM

25M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
35M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
35M ft.....6/4 1s & 2s
50M ft.....6/4 No. 1 Com.
60M ft.....8/4 1s & 2s
60M ft.....8/4 No. 1 Com.
40M ft.....10 & 12/4 No. 1 C&B

QUARTERED SAP GUM

25M ft.....5/4 No. 1 Com.
25M ft.....6/4 FAS
100M ft.....8/4 No. 1 C&B
19M ft.....10/4 No. 1 Com.

PLAIN SAP GUM

100M ft.....5/8 1s & 2s
100M ft.....5/8 No. 1 Com.
50M ft.....3/4 1s & 2s
50M ft.....3/4 No. 1 Com.
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
100M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.

PLAIN WHITE OAK

25M ft.....3/4 1s & 2s
50M ft.....3/4 No. 1 Com.
25M ft.....4/4 1s & 2s
25M ft.....4/4 No. 1 Com.

PLAIN RED OAK

100M ft.....3/4 1s & 2s
100M ft.....3/4 No. 1 Com.
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
25M ft.....8/4 No. 1 C&B

QUARTERED RED OAK

50M ft.....4/4 No. 1 Com.

QUARTERED WHITE OAK

50M ft.....4/4 No. 1 Com.

COTTONWOOD

100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
100M ft.....6/4 1s & 2s
25M ft.....6/4 No. 1 Com.

QUARTERED TUPELO

50M ft.....4/4 No. 1 C&B

PLAIN TUPELO

50M ft.....5/8 No. 1 C&B
50M ft.....3/4 No. 1 C&B
100M ft.....4/4 1s & 2s
100M ft.....4/4 No. 1 Com.
50M ft.....5/4 1s & 2s
50M ft.....5/4 No. 1 Com.
50M ft.....6/4 1s & 2s
50M ft.....6/4 No. 1 Com.

WILLOW

100M ft.....4/4 1s & 2s
200M ft.....4/4 No. 1 Com
100M ft.....5/4 1s & 2s
100M ft.....5/4 No. 1 Com.
75M ft.....6/4 1s & 2s
15M ft.....6/4 No. 1 Com.
15M ft.....8/4 1s & 2s
50M ft.....8/4 No. 1 Com.

Band-mills at Baton Rouge, La., Tallulah, La., and Sondheimer, La.
Distributing yard and office, Chelsea and McLean Ave. Memphis, Tenn.

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Bigelow HARDWOOD PRODUCTS

The SYMBOL of SERVICE

A Complete Stock of Assorted Grades and Thicknesses

NORTHERN HARDWOODS

ASH, BEECH, BIRCH, BASSWOOD
SOFT ELM, ROCK ELM, HARD MAPLE

THE BIGELOW-COOPER CO.
BAY CITY - - MICHIGAN

The Pedwell Hardwood Lumber Company

FOOT SPADINA AVE. — TORONTO

Full or mixed cars for immediate delivery.

Hard and Soft Maple
Beech, Birch

Rock and Soft Elm
and Basswood

Hardwoods in 4x4, 4x6, 1″ and 2″. No. 3 Common

Why not get in touch with us.

Lumber

Walnut, Mahogany Plain and Quartered Oak, Ash, Cherry

Veneers

Walnut and Mahogany

WE specialize in AMERICAN BLACK WALNUT and can furnish straight cars from 3/8 to 4 inches in thickness. Also can load mixed cars WALNUT and MAHOGANY LUMBER and VENEERS, PLAIN and QUARTERED RED and WHITE OAK, ASH and CHERRY.

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BALTIMORE, Md.

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Will make attractive prices for 4/4 Birch and Elm; immediate shipment. Also have good stock in all thicknesses, Soft & Hard Maple, Ash, and Basswood. Write us for quotations.

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Anderson, Shreiner & Mawson

Phone Main 1604 — 43 Victoria St., TORONTO

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Birch, Maple, Elm, Ash and Basswood

Write or "Phone" for Prices. — Mills at South River, Ont.

McDonagh Lumber Co.

203-204 Confederation Life Bldg. TORONTO,

Wholesale Hardwoods

Native and Foreign

also Crating Spruce, Pine and Hemlock car lots only

Specialties Canadian Birch, Basswood and Maple

Crating Lumber

We specialize in the following Crating lumbers

Spruce, White Pine, Jack Pine, Norway Pine, Balm, Poplar, Birch, Maple, Basswood and Elm.

W. Y. Lloyd

350 Confederation Life Building
TORONTO, CANADA
PHONE MAIN 5532

Stock on Hand in Kitchener for Immediate Shipment

3,000	ft.	4/4 x 10 in. and up Qt'd White Oak Fas.
12,000	"	4/4 x 6 in. and up Qt'd White Oak Fas.
15,000	"	4/4 x 6 in. and up Qt'd White Oak No. 1 com.
2,680	"	3/4 x 13/17 Sap Gum Fas.
4,700	"	3/4 x 3/12 Sap Gum No. 1 Com.
400	"	5/4 x 6 in. Plain red Gum Fas.
4,000	"	4/4 x 6 in. up Sap Gum No. 1 Com.
5,000	"	8/4 x 6 in. up Qt'd red Gum C. & B.
8,000	"	5/4 x 6 in. Plain White Oak Fas. ... ...
2,000	"	6/4 x 4 in. Plain White Oak No. 1 Com.
15,000	"	6/4 x 6 in. Plain red Oak Fas.
10,000	"	8/4 x 6 in. Plain red Oak Fas.
25,000	"	8/4 x 4 in. Plain red Oak No. 1 Com.
12,000	"	4/4 x 3 in. Tenn. Red Cedar No. 1 C. & B.
25,000	"	8/4 Sound Wormy Chestnut
2,000	"	5/4 Sount Wormy Chestnut
32,000	"	6/4 Sound Wormy Chestnut
5,000	"	4/4 Chestnut No. 1 C. & B.
10,000	"	5/4 Chestnut No. 1 C. & B.
10,000	"	6/4 Chestnut No. 1 C. & B.
43,000	"	4/4 Soft Elm No. 3 C. & B.
1,000	"	4/4 Soft Elm No. 3 Common
12,000	"	8/4 Soft Elm No. 2 C. & B.
15,000	"	12/4 Soft Elm No. 2 C. & B.
5,285	"	12/4 Oak No. 2 Common & Better
6,000	"	12/4 Oak No. 2 and 3 Common
12,000	"	4/4 Hard and soft Maple No. 3 C. & B.

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Office: 298 Breithaupt St., KITCHENER, ONT.

J. R. EATON & SONS, LIMITED

MANUFACTURERS OF HIGH GRADE WOOD PRODUCTS

Wood Turnings, Hardwood Dowels, Turned Table Legs, Kitchen Tables, Kitchen Cabinets, Oak Extension Tables, Oak Library Tables, "Empire Brand" Hardwood Flooring in Maple, Birch, and Plain or Quarter Cut Oak, Solid Pine and Veneered Hardwood Doors.

A Large Factory equipped with up-to-date machinery is at your service to furnish "WHAT YOU WANT"— WHEN YOU WANT IT."

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Orillia Ontario Canada

Buffalo for Hardwoods

"LET BUFFALO DO IT"

Do you want prompt shipment? We can give you service. Buffalo dealers have 60,000,000 to 75,000,000 feet of dry hardwoods of all kinds and thicknesses.

Immediate shipments and deliveries can be made on any of the 25 railroads entering the city. Buy Hardwoods in Buffalo.

Frank T. Sullivan
Specialities:
CHERRY, WALNUT and PACIFIC COAST WOODS
Main Office: 600 Ellicott Square.
Yard: 2598 Delaware Avenue.

T. Sullivan & Company
Northern Grey Elm
and
Brown Ash
Niagara Street Cornor Arthur

ATLANTIC LUMBER COMPANY
HARDWOODS
West Virginia Soft Red and White Oak
Our Speciality: West Virginia and Pennsylvania Cherry
1055 Seneca Street

Miller, Sturm & Miller
1142 Seneca Street
Hardwoods of All Kinds

YEAGER LUMBER CO., Inc.
SPECIALITIES
Oak, Poplar, Ash, Maple
932 Elk Street.

STANDARD HARDWOOD LUMBER COMPANY
HARDWOODS
Prompt Shipment { From Buffalo Yards or from mill direct to you
8 Million Feet Dry Stock on hand
1333 Clinton St.

G. Elias & BRO., Inc.
Established 1881
All Kinds of Hardwood Lumber
And in addition we carry a full line of White Pine, Yellow Pine, Spruce, Hemlock and fir timber, Lumber, Millwork and Boxes—Maple and Oak Flooring
Careful attention to mixed car orders.

Buffalo Hardwood Lumber Co.
J. B. WALL, Pres.
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M. M. WALL, Treas.
940 SENECA ST.
We Specialize in White Ash, Oak, Map
We also handle a complete stock of Quartered Oak, Maple, Poplar, Red Cedar, etc.

HUGH McLEAN LUMBER CO.
Hardwoods of all Kinds
Our Specialties—QUARTERED WHITE OAK, SAP AND RED GUM
940 ELK STREET

TAYLOR & CRATE
Hardwoods of All Kinds
A stock of 18,000,000 to 20,000,000 feet of hardwoods carried at all times at our two big Buffalo Yards
Established 50 Years
RAIL OR CARGO SHIPMENTS

Blakeslee, Perrin & Darling
A Complete Stock of Seasoned Hardwoods
including Ash, Basswood, Birch, Cherry, Chestnut, Cypress, Elm, Gum, Hickory, Maple, Plain and Quartered Oak, Poplar and Walnut.
1100 Seneca Street

OTIS
TRADE MARK

Tabasco
Honduras

ESTABLISHED 1867
INCORPORATED 1886

Laguna
Mexican

MAHOGANY

Rarely are such stores of precious wood to be found as may be seen in our yards. Across the seas from tropic lands it comes. From thick jungles where the light of day but dimly penetrates and where tangled native paths make difficult the bringing out of timber. Here the black man labors, risking life from jungle dangers, that supplies will not diminish and your orders may be filled.

Twelve million feet per year is the capacity of OTIS mills. An adequate supply is always on hand for prompt shipment. Get our prices.

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Peters Avenue and The River

NEW ORLEANS, LA.

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Huntington - W. Va.

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West Virginia and Southern

HARDWOODS

We specialize in

Oak Tie Siding
White and Red Oak
Yellow Poplar
Basswood
Chestnut and
Gum Lumber.

Canadian Sales in Charge of

C. W. PETERS

Vice President and Manager of Lumber Dept.

Peytona Lumber Co. Inc.

HUNTINGTON, W. VA.

BAND MILLS OMAR, CHRISTIAN LOGAN COUNTY, W. VA.

Band Sawed West Virginia Hardwoods

WHITE OAK	BASSWOOD
RED OAK	MAPLE
CHESTNUT	BEECH
POPLAR	HICKORY

Our own facilities for Surfacing, Resawing and Kiln Drying

William S. Whiting Company

JOHNSON CITY, TENNESSEE

1 Band Mill *5 Circular Mills*

Hardwood Lumber

Oak	Basswood
Maple	Buckeye
Chestnut	Poplar
Ash	Birch

Rotary-Cut Soft Yellow Poplar Veneers
Quarter-Sawn White Oak Flitches
Sliced and Sawn Quartered White Oak Veneers
Oak and Maple Flooring
Dowel Pins and Dowel Rods
Glued-Up Chestnut Cores and Dimension

5-16' Oak Parquetry Flooring Strips and Squares carried in stock at our warehouses:
138 44th St., Brooklyn, N.Y., and at Elizabethton, Tenn.

Arkla Lumber & Mfg. Company

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Manufacturers and Wholesalers

Ash—Plain and Qtd. White and Red Oak Poplar, Cypress, Gum

In addition to stocks at Mill, we carry a well assorted dry stock of all items on our St. Louis yard available for immediate shipment. Write or wire us (our expense) for quotations.

F. HUNTINGTON SMITH

Canadian Representative

Miller Lumber Company, Marianna, Arkansas, U. S. A.

Manufacturers of Southern Hardwoods

QUARTERED WHITE OAK

		Quantity
4/4	FAS	15,000
4/4	FAS	50,000
5/4	FAS	25,000
6/4	FAS	2,000
6/4	FAS	15,000
8/4	FAS	20,000
4/4	No. 1 Com.	400,000
5/4	No. 1 Com.	12,000
6/4	No. 1 Com.	4,000
6/4	No. 1 Com.	5,000
8/4	No. 1 and 2 Com.	6,000
4/4	No. 2 Com.	100,000

PLAIN WHITE OAK

4/4	FAS	18,000
4/4	FAS	40,000
5/4	FAS	10,500
8/4	FAS	5,000
4/4	No. 1 Com.	300,000
4/4	No. 1 Com.	200,000
5/4	No. 1 Com.	30,000
6/4	No. 1 Com.	40,000
8/4	No. 1 Com.	40,000
4/4	No. 2 Com.	250,000
4/4	No. 2 Com.	100,000
5/4	No. 2 Com.	8,500
6/4	No. 2 Com.	10,500
8/4	No. 2 Com.	15,000

QUARTERED RED OAK

4/4	No. 1 and 2 Com.	35,000
4/4	No. 1 and 2 Com.	50,000

PLAIN RED OAK

4/4	FAS	60,000
5/4	FAS	30 000
8/4	FAS	18,000
4/4	No. 1 Com.	500,000
4/4	No. 1 Com.	200,000
5/4	No. 1 Com.	33,000
6/4	No. 1 Com.	11,000
8/4	No. 1 Com.	32,000

		Quantity
4/4	No. 2 Com.	600,000
4/4	Sound Wormy	100,000
4/4	No. 3 Com.	500,000
5/4	No. 3 Com.	32,000
6/4	No. 3 Com.	15,000

MISCELLANEOUS OAK

4/4	3-5½″ clr. Pl. Wh.O. Strips	5,000
4/4	3-5½″ clr. Pl. R.O. Strips	5,000
4/4	2-5½″ clr. Qt. W.O. Strips SND	15,000
5/4	Pl. R.O. Step Plank, 11″ & up.	11,000
8/4	R&W O. Bridge Plank	75,000
10/4	R&W O. Bridge Plank	15,000
12/4	R&W O. Bridge Plank	15,000

QUARTERED RED GUM

5/4	No. 1 C&Btr.	15,000
6/4	No. 1 C&Btr.	19,000
8/4	No. 1 C&Btr.	22,000
5/4	No. 1 Com.	13,000

PLAIN RED GUM

4/4	FAS	58,000
6/4	FAS	8,700
6/4	No. 1 Com.	3,700

SAP GUM

4/4	9-12″ Bx. Bds.	63,000
4/4	9-12″ Bx. Bds.	50,000
4/4	13-17″ Bx. Bds.	56,000
4/4	18″ & up Pan & W No. 1	4,200
4/4	6-12″ FAS	50,000
4/4	13-17″ FAS	40,000
4/4	13-17″ FAS	50,000
5/4	No. 1 C. & Btr.	134,000
6/4	No. 1 C. & Btr.	83,000
4/4	No. 1 Com. Sap	200,000
4/4	No. 1 Com. Sap	200,000
5/4	No. 1 Com.	9,000
6/4	No. 1 Com.	5,000

TUPELO

4/4	6-12″ FAS	21,000
4/4	13-17″ FAS	4,600
4/4	9-12″ Bx. Bds.	6,800

		Quantity
4/4	13-17″ Bx. Bds.	2,300
4/4	No. 1 Com.	45,000

ASH

5/4	No. 1 C. & Btr.	1,300
8/4	No. 1 C. & Btr.	20,000
10/4	No. 1 C. & Btr.	15,000
12/4	No. 1 C. & Btr.	15,000

COTTONWOOD

4/4	FAS 6-12″	110,000
4/4	FAS 13-17″	27,000
4/4	18″ & up Pan. & W. No. 1	9,900
4/4	9-12″ Bx. Bds.	32,000
4/4	13-17″ Bx. Bds.	20,000
4/4	No. 1 Com.	100,000
4/4	No. 1 Com.	50,000
4/4	No. 2 Com.	100,000
4/4	No. 2 Com.	50,000

ELM

4/4	No. 1 C. & Btr.	69,000
6/4	No. 1 C. & Btr.	42,000
8/4	No. 1 C. & Btr.	15,000
10/4	No. 1 C. & Btr.	36,000
12/4	No. 1 C. & Btr.	32,000

MAPLE

4/4	Log Run	74,000
5/4	Log Run	62,000
6/4	Log Run	12,500
8/4	Log Run	100,000
8/4	Log Run	100,000

SYCAMORE

5/8″	No. 2 C. & B. Qtd.	30,000
4/4	No. 2 C. & B. Qtd.	138,000
4/4	No. 1 C. & B. Pl.	150,000
4/4	No. 1 C. & B. Pl.	150,000

CYPRESS

4/4	FAS	6,500
5/4	FAS	10,000
6/4	FAS	11,000
8/4	FAS	15,000

BY MAKING TEST RUNS OF YOUR LUMBER

You will find that our stock will reduce your costs to a minimum and improve the quality of your product. Indiana hardwoods cost no more than the other kinds—then why not use them ?

Wo are the largest hardwood producers in Indiana and give below a partial list of stock on hand:

INDIANA QUARTERED WHITE OAK

	1s & 2s	No. 1 Com.	No. 2 Com.
1/2″	1 car	1 car	
5/8″	2 “	4 “	
3/4″	1 “	5 “	1 car
4/4″	3 “	4 “	4 “
5/4″	1 “	3 “	1 “
6/4″	1 “	3 “	
8/4″	1 “	2 “	

Also Clear and No. 1 Common Quartered White Oak Strips.

INDIANA QUARTERED RED OAK

	1s & 2s 6″ & up	1s & 2s 9″ & up	No. 1 Com.	No. 2 Com.
1/2″—3500′				
5/8″—1 car			1 car	
4/4″—3 car		1 car	3 “	1 car
5/4″—2 “		1 “	2 “	
6/4″—2 “		2500′	1 “	
7/4″—1 “		4500′		
8/4″—2000′		3000′	1 “	

PLAIN WHITE OAK

	1s & 2s	No. 1 Com.	No. 2 Com.
5/8″	1 car	1 car	
3/4″		4000′	
4/4″	2 “	4 cars	2 cars
5/4″	1 “	3 “	1 “
6/4″	1 “	2 “	
8/4″	3 “	2 “	
2½″	½ “	1 “	

PLAIN RED OAK

	1s & 2s	No. 1 Com.	No. 2 Com.
5/8″	2 cars	2 cars	
3/4″		5000′	
4/4″	4 “	4 cars	3 cars
5/4″	1 “	3 “	
6/4″	1 “	4 “	
8/4″	2 “	3 “	
2½″	2 “	3 “	

BLACK WALNUT—Steamed Stock

	1s & 2s	No. 1 Com.	No. 2 Com.
4/4″	1 car	3 cars	12000′
5/4″	1 “	1 “	9000′
6/4″	4000′	4000′	
8/4″	1 car	1 car	

1 car 5/8″ Log Run, not steamed.

WE ARE IN POSITION TO KILN DRY THIS LUMBER. ASK FOR OUR RATES.

We also have good stocks of Poplar, Ash, Beech, Hickory, Maple, Gum, Tupelo, etc.—Write us for prices.

Maley & Wertz Lumber Company

EVANSVILLE, INDIANA

MILLS AT EVANSVILLE, IND., GRAMMER, IND., and KEIRNS, MISS.

Hardwoods

We can furnish you immediately Factory Stock including all grades and thicknesses of

Walnut, Chestnut Mahogany, Teak, Oak Ash, Cypress

ALSO

VENEERS

Oak, Maple, Walnut and other Fancy Woods

The McLennan Lumber Co. Limited

MONTREAL

Hardwood Dowels

Plain, Straight and Spiral Grooved

"Canada Wood" dowels are manufactured from high-grade Maple, Birch, Beech or White Oak, uniform in length and nicely pointed, quality guaranteed.

We also manufacture Bailwoods and Variety Turnings in all styles, sizes and descriptions, in the plain, or Enamelled in Black, Natural Wood or Mahogany finishes. Three-eighth in. Maple, Birch and Quarter Cut White Oak Flooring a Specialty. Broom and Mop Handles of every description.

Canada Wood Specialty Co.

Orillia, Ontario

Sawmills at Zebra and Orillia, Ont.
Cable Address: "Special," Orillia, Can.

SOUTHERN HARDWOODS

Dry Lumber in Buffalo for Quick Shipment

TENESSEE SCENTED CEDAR

1 in.—58,000
1¼ in.— 3,500
1½ in.—

CHERRY

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
1 in.	44,500	......	203,900	18,500
1¼ in	4,900	......	37,600	7,500
1½ in.	2,000	......	34,700	36,300
2 in.	6,000	......	22,200	61,900
2½ in.	5,500	......	4,300	2,200
3 in.	25,700	......	6,500	3,300
4 in.	4,000	......	900	400

CHESTNUT

	1 & 2	Clear Strips.	No. 1 Com.	S.W. & No. 2 Com.
¾ in.	500	......	56,000	91,000
1 in.	11,000	500	45,000	1,000
1¼ in.	66,800	300	100,200	159,200
1½ in.	34,500	......	40,000	......
2 in.	2,200	......	15,300	89,200
2½ in.	4,000	......	1,500	......
3 in.	1,100	......	1,000	500
4 in.	1,500	......	......	......

QUARTERED WHITE OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
½ in.	6,500	......	......	......
¾ in.	900	300	23,600	9,000
⅝ in.	2,800	......	5,500	800
1 in.	17,300	10,000	52,400	27,000
1¼ in.	5,000	......	6,000	......
1½ in.	600	......	2,400	......
2 in.	......	......	25,100	5,700
2½ in.	2,000	......	400	......
3 in.	2,000	......	1,300	......
4 in.	2,500	......	1,700	......

PLAIN WHITE OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
⅜ in.	1,000	......	......	......
½ in.	100	......	......	......
⅝ in.	2,150	......	8,000	16,900
¾ in.	274,800	......	453,800	122,000
1 in.	42,300	1,700	78,000	85,200
1¼ in.	6,300	......	15,100	......
1½ in.	51,300	......	84,000	12,000
2 in.	29,000	......	125,000	54,000
2½ in.	152,800	......	69,500	3,000
3 in.	55,800	......	75,800	14,400
3½ in.	4,500	......	4,000	1,500
4 in.	65,000	......	38,500	6,000

PLAIN RED OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
⅜ in.	24,200	......	......	......
¾ in.	170,000	......	327,000	65,800
⅝ in.	2,400	......	77,000	42,600
1 in.	30,200	3,150	56,000	125,400
1¼ in.	11,700	2,400	16,600	......
1½ in.	138,900	4,300	46,200	32,000
2 in.	91,500	......	162,000	71,000
2½ in.	70,100	......	26,000	3,700
3 in.	23,800	......	20,500	7,000
4 in.	16,600	......	10,900	......

QUARTERED RED OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
¾ in.	1,700	......	9,700	500
1 in.	10,200	5,400	7,500	1,400
1¼ in.	2,000	......	......	......
1½ in.	......	......	......	......
2 in.	......	......	7,400	......

SAP GUM

	1 & 2	Strips.	No. 1 Com.	No. 2 Com.
1 in.	......	16,000	21,000	......
1¼ in.	......	......	......	......
1½ in.	......	2,400	6,000	13,500
2 in.	......	......	5,700	10,400
2½ in.	......	......	......	......

QUARTERED SAP GUM

	1 & 2	No. 1C	No. 2C
4/4	......	2,500	12,000
5/4	14,000	......	......
8/4	20,000	9,000	200
10/4	10,250	23,000	1,800

PLAIN RED GUM

			No. 1	No. 2
1 in.	......	16,300	10,900	9,500
1¼ in.	......	6'000	8,325	......
1½ in.	......	12,000	13,300	9,500
2 in.	......	9,000	3,000	5,500

QUARTERED RED GUM

	1 & 2	No. 1C	No. 2C
4/4	2,000	6,000	7,000
5/4	9,400	10,800	......
6/4	8,900	5,500	4,600
8/4	1,300	19,500	3,600

POPLAR

	1 & 2	Bright Saps	No. 1 Com.	No.2 Com.
⅝ in.	18,000	15,800	31,300	800
1 in.	27,000	5,200	91,900	......
1¼ in.	22,300	330	5,700	6,000
1½ in.	19,100	13,000	29,000	7,500
2 in.	15,000	......	10,500	24,500
2½ in.	10,800	6,000	......	......
3 in.	17,900	......	11,400	47,000
4 in.	6,500	......	300	450

Also Large Stocks of Ash, Basswood, Beech, Birch, Hard and Soft Maple.

THE ATLANTIC LUMBER CO., 310 Manning Chambers, Toronto

MANUFACTURERS SOUTHERN HARDWOOD LUMBER

Yards: BUFFALO, N.Y.

Mills: KNOXVILLE, TENN.; FONDE, KENTUCKY

Sawed Veneer

Quartered White Oak
For Furniture and Panels

Plain Red Oak
For Interior Trim and Doors

Cypress
For Battery Separators

Manufacturing Uniformly Good. Quality Unsurpassed

James E. Stark & Co., Inc.
MEMPHIS, TENN.

BEDNA YOUNG Lumber Company

Jackson - Tennessee

Manufacturers of

Quartered White Oak
Quartered Red Oak
and Other Hardwoods

When in the market for
High Grade Lumber
please let us have your enquiries.
Sales Office: 610 Lombard Bldg.
Indianapolis, Indiana

Southern Hardwoods

of standard excellence, including band-sawn white and red oak, gum and ash; Oak Flooring, too! In the same car, as well as square-edge parquetry strips, there are oak trim and mouldings.

Immediate Service for Exacting Buyers

E. L. BRUCE COMPANY
MANUFACTURERS
MEMPHIS, TENN.

Band Mill: Little Rock
Oak Flooring Plants: Memphis; Little Rock

We specialize in Birch, Basswood, Hard Maple

A High Standard of Quality and Service

500M	4-4	Unselected	Birch	500 M	4-4	Basswood		500M	4-4	Hard	Maple
300M	5-4	"	"	300M	5-4	"		400	5-4	"	
150	6-4	"	"	200	6-4	"		400	6-4	"	
125	8-4	"	"	75	8-4	"		600	8-4	"	
150	10-4	"	"					400	10-4	"	
150	12-4	"	"					300	12-4	"	
75	14-4	"	"					75	14-4	"	
75	16-4	"	"					100	16-4	"	

Sawyer Goodman Company

Marinette - Wisconsin

WE ARE TELLING THE PUBLIC: "BE SURE YOUR WALNUT IS REAL WALNUT."

AMERICAN WALNUT

"The Cabinet-wood of the Ages"

WE ARE TELLING THE PUBLIC: "BE SURE YOUR WALNUT IS REAL WALNUT."

SALES AMMUNITION:

Our "All-America" campaign for American Walnut *Trade Extension* through advertising is furnishing alert manufacturers and dealers with innumerable selling arguments. The *Walnut facts* alone are what clinch the sales. The best public is "all for American Walnut."

In all of our advertising, including the beautiful series of four-color illustrations in the leading magazines, we are continually driving home the long list of American Walnut's simple and enduring virtues—rich *natural* color, supreme stability and strength, easy working properties, and *unfading* beauty. No stain is needed to produce the royal elegance of warm browns so coveted by the best trade.

One of the chief causes of the steadily rising demand for American Walnut furniture and interior trim is its faculty for *growing in beauty with the passing of the years.*

"The Cabinet-wood of the Ages" is a true phrase.

Our Walnut Brochure, de luxe, is filled with ideas and suggestions of interest and value to the trade. A request will bring it, with our compliments.

AMERICAN WALNUT MANUFACTURERS' ASSOCIATION

ROOM 1019 616 SOUTH MICHIGAN BOULEVARD CHICAGO, U. S. A.

Burns & Knapp Lumber Co.

Manufacturers of

Southern Hardwoods

Plain White and Red Oak, Dimension Oak, Hickory, Ash, Chestnut, Poplar, Basswood, Walnut, Maple, Beech, Butternut.

CONNEAUTVILLE, ——————— PA.

OAK, ASH, ELM, MAPLE, SAP-GUM, RED-GUM, CYPRESS, SYCAMORE, COTTONWOOD

Chapman & Dewey Lumber Co.

Manufacturers

Operating Three Sawmills in Heart of St. Francis Delta

MAIN OFFICE
940-950 Bank of Commerce Bldg. Memphis Tenn.

Branch Sales Office:
500 Rialto Bldg., Kansas City, Mo.

Mills:
Marked Tree, Ark.

The Gulf Lumber and Trading Corporation

NEW ORLEANS, LA.

BAND SAWN **MAHOGANY LUMBER** EXCLUSIVELY

We always carry a large stock of high grade Mahogany Lumber in all dimensions and grades on our yard in New Orleans

Your Inquiries will be appreciated **General Office, NEW ORLEANS, U.S.A**

Reese Sheriff Lumber Co.

WILLIAMSPORT, PENNSYLVANIA

Manufacturers of

Northern and Southern Hardwoods White Pine, Spruce and Hemlock

With special attention to **Oak, Chestnut, Poplar, Cherry, Walnut, Gum and Basswood.**

OUR MOTTO

REASONABLE PRICES—that you can afford to pay.
EFFICIENT SERVICE — that you have a right to expect
FAIR TREATMENT — that you can depend on getting

We would appreciate an opportunity of furnishing a portion of your lumber requirements.

L. D. MURRELLE LUMBER COMPANY

BAND MILL : BUDE, MISS.

General Sales Offices : 1524 Exchange Building, Memphis, Tenn.

A few Specials :

130,000 ft. 4-4" No. 1 and No. 2 Com. Qtrd. White Oak
85,000 ft. 4-4" No. 1 and No. 2 Com. Qtrd. Red Oak
100,000 ft. 4-4 No. 1 and No. 2 Com. Plain Red Oak

Manufacturers of White and Red Oak, Poplar, Gum, Ash, Magnolia and Beech

We Specialize in Quartered WHITE OAK and POPLAR

Stimson Veneer and Lumber Co.

(Inc.)

Office and Mill: McLean Ave. and Union Belt R.R.

Memphis - Tenn.

We sell only the product of our own mills and make band sawn lumber in all Southern Hardwoods.

We specialize in Quartered White Oak, Red Oak, and Red Gum.

With allied companies we make fifty million feet annually.

J. V. Stimson Hardwood Co.

Manufacturers and Exporters

Band Mills: Memphis, Tenn., Helena, Ark.

Memphis - Tenn.

STOCK LIST

QUARTERED WHITE OAK
- 3 cars 4/4" 1s and 2s.
- 5 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common .

QUARTERED RED OAK
- 5 cars 4/4" 1s and 2s.
- 10 cars 4/4" No. 1 Common.
- 4 cars 4/4" No. 2 Common.
- 2 cars 6/4" No. 1 Common and Better.

QUARTERED RED GUM
- 10 cars 4/4" 1s and 2s.
- 3 cars 4/4" 1s and 2s Fig.
- 2 cars 5/4" 1s and 2s.
- 2 cars 6/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 2 cars 5/4" No. 1 Common.
- 2 cars 6/4" No. 1 Common.

QUARTERED RED GUM, Sap no Defect
- 5 cars 6/4" No. 1 Common and Better.
- 10 cars 8/4" No. 1 Common and Better.

ASH
- 4 cars 10/4" No. 1 Common and Better.
- 1 car 12/4" No. 1 Common and Better.
- 1 car 6/4" No. 1 Common and Better.
- 2 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common.

SAP GUM
- 10 cars 4/4" 1s and 2s.
- 20 cars 4/4" No. 1 Common.
- 10 cars 4/4" No. 2 Common.
- 2 cars 4/4" 18" up Panel.
- 5 cars 4/4" 13-17" Box Boards.

PLAIN RED OAK
- 2 cars 4/4" 1s and 2s.
- 2 cars 6/4" No. 1 Common and Better.
- 2 cars 10/4" No. 1 Common and Better.

PLAIN WHITE OAK
- 4 cars 4/4" No. 1 Common Plain.

COTTONWOOD
- 2 cars 4/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 5 cars 4/4" No. 2 Common.

ELM
- 2 cars 4/4" Log Run.
- 10 cars 10/4" Log Run.
- 10 cars 12/4" Log Run.

MAPLE
- 4 cars 12/4" Log Run.

WAYNE LUMBER CO.

Manufacturers and Wholesalers

Canadian Hardwoods

BIRCH AND MAPLE

OUR SPECIALTY

Elm, Ash, Basswood, Beech, Chestnut, Oak, and Poplar

110 West 40th St. New York

Canadian Representative,
D. Cote, 730A Champagneur, Outremont, Montreal

Band Sawn West Virginia Hardwoods

Our timber, of virgin growth in Greenbrier and Pocahontas Counties, limestone soil, gives a combination of Texture, Quality and Character that is most desirable to the Woodworking trade.

The most critical Hardwood users are among our best accounts. Why?

The W. C. Barlett Lumber Co.
Charleston, W. Va.

A "Quality" you will admire
A "Service" you will appreciate

We have the facilities for giving Canadian Woodworkers and Furniture Manufacturers a prompt service on straight or mixed cars of the following:

Ash, Oak, Gum, Poplar, Hickory, Walnut, Chestnut, Beech, Maple, Elm, Sycamore, Cottonwood.

Soft textured Plain and finely figured Quarter-Sawn Red and White Oak our specialty.

J. V. Stimson & Company
OWENSBORO - KENTUCKY
Bandmills Owensboro; Campbellsville, Kentucky

D. E. Hewit Lumber Co.

Huntington, W. Va.

MANUFACTURERS

West Virginia Hardwoods

(Not Better than the Best but as Good as the B est

FAS Plain White and Red Oak
No. 1 Com. Plain White and Red Oak
Implement Oak
Sound Wormy Chestnut
No. 1 Common and Better Chestnut
Hickory Plank
Poplar and Basswood

OAK

Plain and Quartered
Uniform Color—Soft Texture

Poplar, Ash

and other

Hardwoods

We carry 35,000,000 feet dry stock—all of our own manu facture.

Oak Timbers and Planking

The Mowbray & Robinson Co.
(INCORPORATED)
Manufacturers
Office: CINCINNATI, OHIO

MILLS
Quicksand, Ky.; West Irvine, Ky.

Canadian Representative :
A. K. Johuson, Traders Bank Building, Toronto, Ont

Frank Purcell
Walnut Lumber Co.

Plenty of logs like the portion of our stock shown above have made possible the million and a half foot stock of well manufactured American Walnut Lumber which we now have to offer.

Prompt shipment
All grades and thicknesses
Guaranteed Inspection

12th AND BELT LINE
Kansas City - Kansas

Nichols & Cox Lumber Co.

GRAND RAPIDS - MICHIGAN

We can ship promptly the following items. Can also kiln dry if desired.

2 cars	4/4	1st and 2nd	Sap Gum
5 "	4/4	No. 1 Com.	"
3 "	5/4	No. 1 Com. and Better	"
2 "	6/4	"	"
2 "	8/4	"	"
4 "	6/4	"	Qtd Sap Gum
5 "	8/4	"	"
3 "	0/4	"	"
2 "	12/4	"	"
3 "	4/4	"	Plain Red Gum
1 "	5/4	"	"
1 "	6/4	"	"
1 "	8/4	"	"
2 "	4/4	1st and 2nd	Plain Red Oak
3 "	4/4	No. 1 Com.	"
1 "	5/4	No. 1 C & B	"
1 "	6/4	"	"
1 "	8/4	"	"
1 "	4/4	1st and 2nd	Plain White Oak
2 "	4/4	No. 1 Com.	"
2 "	10/4	No. 1 Com. and Better	Birch
1 "	12/4	"	"
1 "	10/4	"	Basswood
5 "	6/4	No. 2 Com. and Better	Gray Elm
5 "	4/4 to 8/4	No. 1 Com. and Better End Dried	White Maple

Send us your enquiries for anything needed in Northern and Southern Hardwoods.

DIMENSION

My Specialty is

Dimension Lumber

For Manufacturers of

Wagons and Implements, Buggies and Autos, Furniture, Railroad Car and Track Material

Standard Sizes on Hand for Prompt Shipment. Special Sizes Cut to Order

SOUTHERN HARDWOOD LUMBER

C. B. COLBORN

Office, Dimension Mill & Yard
Belt Line at McLean.

MEMPHIS - TENN.

A name that should be on your inquiry list for Hardwood Lumber

American Column & Lumber Co.

Brunson Building, COLUMBUS, OHIO

—Manufacturers of—

West Virginia

Soft Yellow Poplar
Plain White Oak
Plain Red Oak
Quartered White Oak
White Oak Timbers and Plank

Chestnut	Butternut
Basswood	Ash
Maple	Cherry
Hickory	Walnut
Beech	Sycamore
Buckeye	Black Gum
Birch	Hemlock

Oak and Hardwood Dimension Stock

Steele & Hibbard Lumber Co.

ST. LOUIS, MO.

56 Years in Business

We carry a large stock of dry

Hardwood Lumber

25 Different Kinds
Quick Shipment
Write or wire for Prices

We specialize Oak cut from Mild Texture Missouri Timber with thin sap both plain and quarter sawed.

We ship also from Sawmills direct ; Red as well as Sap Gum and Poplar both plain and quarter sawed, Sound Wormy Chestnut, Cypress and Ash.

"Wire collect for prices or other information. Time is Money, delays pay no dividend."

St. Francis Basin Hardwoods

Kraetzer Cured and Air Dried

Tennessee Aromatic Red Cedar

Carloads and less or mixed with Hardwoods

"What Others Say"

"Your letter of February 15th received and we want to say that this was a very nice lot of lumber. It was good widths and lengths and well manufactured, dry stock and the grading was very liberal. We are sorry we cannot use more of this lumber at the present time. ***We received several cars from other manufacturers at a cheaper price but the lumber was not nearly as satisfactory.*** When we are in need of more stock we will take the matter up with you."

(Note—The above was sent us February 24, 1921 unsolicited. Name given on application).

GEO. C. BROWN & COMPANY

Home Office - MEMPHIS, TENN.

BAND MILLS, PROCTOR, ARK. CROOKED BAYOU, ARK.

BLACK BROS.
CLAMPS

Where Black Bros. Clamps are known, there is no second choice. Know them.

Sold by Aikenhead Hardware Ltd., Toronto Vokes Hardware Co., Ltd. Toronto J. L. Neilson & Co., Winnipeg and other leading dealers throughout Canada.

The Black Bros. Co. - Mendota, Ill., U.S.A.

The Door Carrier System

Makes your dry-kiln doors steam-tight and saves time, heat, trouble and money.

Carrier lifts door clear of kiln and carries it down track. Returning, deposits door to rabbeted joint, where it is held steam-tight by its own weight. Applicable to old or new kilns.

Ask for catalogue.

DRY KILN DOOR CARRIER CO.
1117 Cornell Ave.
INDIANAPOLIS, IND.

Yellow Poplar Lumber Co.

Manufacturers of Band Sawed

Poplar Plain Oak
Quartered Oak
Chestnut Basswood

Capacity 50,000,000 per annum

SPECIALTY: Monogram Brand Oak Flooring

CANADIAN ENQUIRIES SOLICITED

COAL GROVE, OHIO, U. S. A.

Tennessee Lumber & Coal Company

Manufacturers and Wholesalers

APPALACHIAN HARDWOODS

Soft Textured White and Red Oak, Poplar, Chestnut, Southern Gum

OAK TIMBERS AND PLANKING CUT TO ORDER

Band Mills: Verdun, Tenn., Louvain, Tenn. Submit your enquiries to our Sales office, Cincinnati, Ohio.

"Hartzell's Choice Walnut"

The way Walnut comes to us

COMING AND GOING

One constant stream of American Black Walnut from "Stump to Consumer" flowing through a steady, reliable and satisfactory channel.

"Geo. W. Hartzell"

Logs in the rough coming in Veneers and Lumber of the highest quality going out daily year in and year out covering a period of. 35 years.

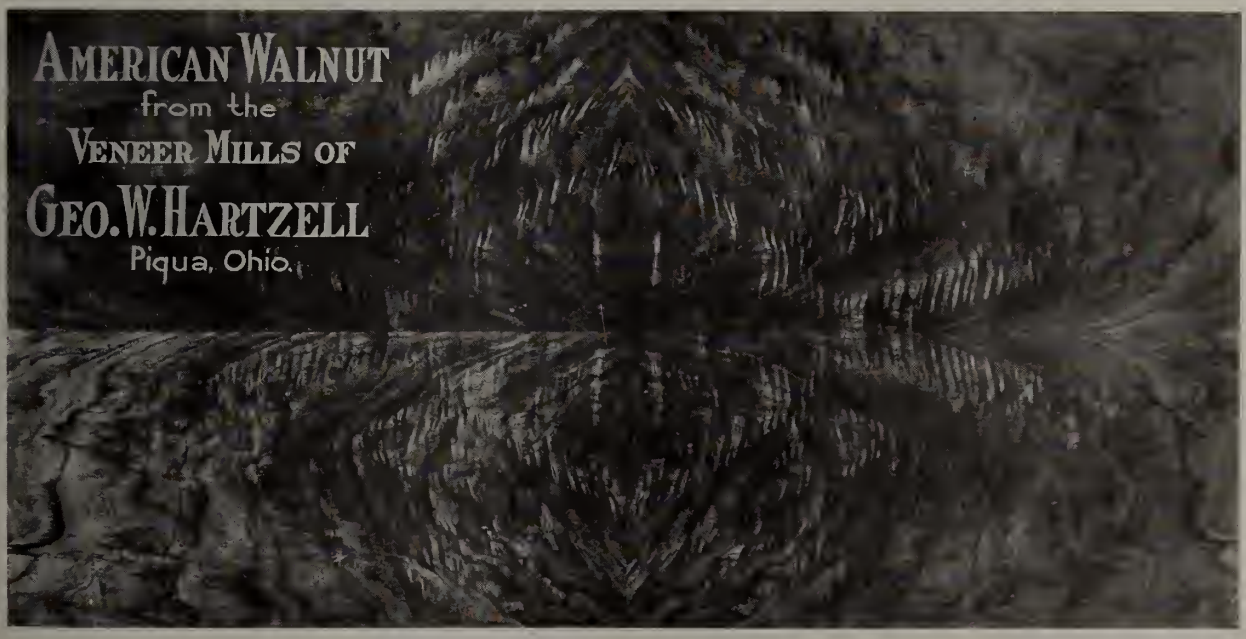
We rightfully claim your patronage because of "SERVICE and QUALITY," if there is any question in your mind about it

"Try Us and We Will Ship You the Convincer"

No Order too large, no Order too small to receive the close and careful attention it is our custom to give. That is a great part of our business, serving our customers.

"WRITE FOR SAMPLES AND QUOTATIONS"

Geo. W. Hartzell - Piqua, Ohio



The way it goes to our Customers

Highest Quality

St. Francis Basin Hardwoods

Band Sawmill - Marmaduke, Ark.

ASH
OAK
GUM
CYPRESS
TUPFLO
SOFT MAPLE

The Vail Cooperage Co.

General Office - FORT WAYNE, Ind.

OUR EXPORT BRAND

Service LHC *Quality*

Prompt Shipment

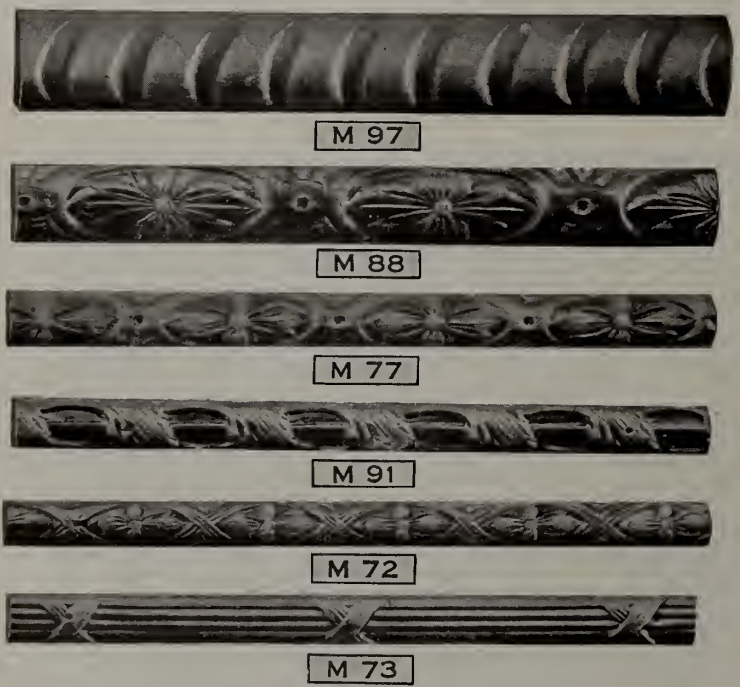
SPECIAL
Plain White Oak
50 M' 1" FAS
30 M' 1¼" FAS
12 M' 1½" FAS
15 M' 2" FAS

SPECIAL
Plain White Oak
70 M' 1" No.1 C&S
20 M' 1¼" No.1 C&S
20 M' 1½" No.1 C&S
15 M' 2" No.1 C&S

GUM
ASH
OAK
POPLAR
CHESTNUT

LIVERPOOL HARDWOOD COMPANY Inc.

50 Church St. NEW YORK CITY
Bank of Commerce Bldg. MEMPHIS, TENN.



MOULDINGS We are making more Period Mouldings than ever before. Orders should be placed early to assure your supply when needed.

KNOBS The Period Knobs we placed on the market a few months ago are proving very popular. If you have not received samples ask for them now.

ROSETTES A new Period item to accompany the knobs.

Waddell Manufacturing Company

Coldbrook and Taylor, N. W. Grand Rapids, Mich.

Reputation - Making Lumber

The person buying a piece of furniture is often attracted by the beauty of the wood even before looking for signs of good workmanship and other essentials.

That is the kind of lumber you want.

And we do not hesitate in saying we can supply you with it.

Just let us have a trial order.

Memphis Band Mill Company

"Makers of high grade lumber"

QUALITY Memphis - Tennessee SERVICE

Efficiency Marks Every Step of Our Service to You

Exact photograph of alley in our yard

White and Red Oak

Plain & Quarter Sawed Red Gum

Our Specialty Quarter Sawed Red Gum in Plain and Figured Wood

From the cutting to the delivery to your hands, our entire stock receives the most careful attention. All the excellence of quality and the beauty of the wood is kept just as it is when cut. When next you are in need of Oak, Ash, Elm, and Cypress of first class quality and in perfect condition write us. We can ship promptly.

BARR-HOLADAY LUMBER CO.

BAND MILL AT LOUISE, MISS. **GREENFIELD, OHIO**

THE NECK OF THE BOTTLE

That is just what your dry kiln and cutting room are to your business.

The volume and quality of your finished product is very largely dependent upon the capacity and efficiency of your dry kilns. Very often this is inadequate.

As a remedy, we recommend that you use "Chicago Mill" Dimension Stock.

First: Because we manufacture stock in strict accordance with your specifications in grade, size and moisture content.

Second: Our Cairo, Illinois, plant, with a kiln capacity of more than 1,500,000 feet per month, is strictly a Dimension Lumber Operation.

Third: "Chicago Mill" stock is cut not accumulated. It is prepared for shipment in bundles which are uniform in size and convenient to handle. Your shipping schedules are strictly observed.

Fourth: The use of "Chicago Mill" Dimension will eliminate waste and effect a saving of at least 40% in freight.

Fifth: It will mean a minimum investment by you in raw materials and in equipment.

Write for prices on your requirements

CHICAGO MILL AND LUMBER COMPANY

DIMENSION STOCK FOR
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Automobiles
Drawer Sides
Kitchen Cabinets
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DIMENSION LUMBER DEPARTMEMT
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CHICAGO, ILLINOIS

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Cottonwood
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WIS

This yard was BUILT for perfect drying. The appearance of the piles will convince every man who knows hardwood lumber.

Lumber Can't Be ALWAYS Good Without Perfect Piling

The *correct* drying of hardwood lumber is a science based on definite formulae. Recognizing this, our yard was *built* to insure the most perfect possible drying.

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Our list includes the standard species and grades of southern hardwoods with NOTHING PICKED OUT, and has behind it a comprehensive and conscientious desire to give the customer his full measure of value and service,

Wisconsin Lumber Company

Chicago, Illinois

BAND MILLS, DEERING, M O.

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PAEPCKE LEICHT LUMBER COMPANY

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BAND MILLS—Helena, Ark., Blytheville, Ark.
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Price Cutting too Prevalent

In which direction is the Canadian woodworking industry heading? Is it progressing forward or is it sliding backward? One would naturally think that as general business conditions continue to improve and as the demand for all lines of wood products is becoming increasingly active, there could only be one reply to such a query. If sound business principles were being followed in this industry, if all items were being sold on a basis of cost plus, that would hold true, and one could safely say that those engaged in woodworking were building on a solid foundation and moving toward an era of increased prosperity.

The "if" in the foregoing paragraph may be taken to represent individuals or organizations which make a practice of cutting prices, of selling below a fair market value, and in many cases of disposing of their product below actual cost. There are those who are willing at all times to give a quotation an extra slash or two, taking a chance that they will be able to make out or working on the principle that if they do not secure the business, their competitor will not stand to make much profit on the transaction. In this respect price-cutting has always prevailed to a greater or less extent.

When conditions were different, when there were enough orders to go round, the fact that a certain amount of business was transacted at a loss passed unnoticed. Usually only such orders as showed a profit were accepted, the undesirable business being left for the other fellow—the other fellow not always realizing that he was working for little or nothing. Now when competition is keen, when a strong effort is made to secure all the business which offers, the price-cutter looms up as a factor of no small importance. That in itself is bad enough, but what is worse is that many who know what they are doing, at least, as far as costs go, have entered the lists, and to-day prices are being cut in an unprecedented manner.

It is time that a halt was called to this unsound practice. If working without a profit is all that is involved, it would be bad enough, but there are other factors to consider. Selling any article near, at, or below its true cost, based on normal overhead and replacement values, may result in a slight increase in demand, but, at the same time, such practice is unsound, economically, as it tends to establish fictitious values below the actual level which should prevail. This applies with equal force to furniture, phonographs, sash and doors, boxes and woodwork in general, for this condition is prevalent in all branches of the industry.

Perhaps a few illustrations might not be out of place. Almost everywhere one goes, incidents are cited where some competitor is accepting business at a loss. One woodworker recently quoted $47.75 on an order for sash. Later upon making inquiries he found that the business had been secured by a rival manufacturer at $31.50. According to the figures of the first man, the lumber involved was worth over $31.50. Certain tables are being sold to-day for $11.50 which actually cost in the neighborhood of $16.00. The same can be said of a line of dressers, the price of which is far below replacement cost. This is bad enough in itself, but there is also someone who says, "I can sell as cheap as the next," or "I am prepared to lose so much," and the field of price-cutting activities is thus increased. The humorous side, if there is any humor in such a situation, is that usually it is the small, uninformed operator, who is the first offender, but he is soon out-shadowed and outdone by the progressive concern which, realizing that it is losing money, deliberately sets out on a price-cutting jaunt in an effort to down what it considers unfair competition.

Any one guilty of cutting prices admits one of four things; that his first price was too high; that his product is below standard; that he is woefully lacking in cost knowledge, or that his competitor is a better salesman. The last item may be the key to the situation, for it has often been suggested that those in the woodworking industry lack constructive sales ability. To them the only way to meet competition is to undersell instead of outsell. If that is so, the remedy should not be hard to find nor difficult to apply.

In the long run the person or firm who, backed with accurate cost knowledge, places a fair value upon their product and then sticks by that price, is usually the one who stays in business regardless of the fluctuation of demand or the ups and downs of general conditions.

Is 1922 to be a Furniture Year?

Rests Largely With Manufacturers Themselves—Publicity Campaign Now Under Way, if Kept Going, Will Materially Increase Sales of Furniture —Are You Lending Your Support.

By L. R. WRIGHT.

The Home Furnishings Bureau is again fuctioning. November 1st, when the Bureau advertisements appeared in a number of the leading newspapers of Canada, witnessed the commencement of the second general publicity campaign to be staged by certain of the furniture manufacturers of Canada.

It is too early in the campaign to make any forecasts though to date the results have been very encouraging. A number of the supporting members can trace sales directly to these advertisements. While this is encouraging, it is only a side issue for the main purpose of the whole scheme, the goal at which all the publicity is directed, is to rouse the buying public to a greater interest in their homes and the manner in which they are furnished and in this way increase the demand for furniture. It goes without saying that this requires time.

The campaign is being well received by both public and dealers. The plan being a little more direct this year, offers the dealer an opportunity for closer co-operation. Full advantage is being taken of this, with the result that as the advertisements appear many dealers are making a special drive on the furniture shown. Last year when the initial campaign was put over, the dealers were carried away by their enthusiasm and the immense possibilities which lay in a co-operative effort of this kind. Naturally when the scheme fell through, their hopes were dashed to the ground. This year they are not being carried away to such an extent, but are basing their support and co-operation on a more matured judgment. That the manufacturers are on the right track in putting across a co-operative scheme to increase the interest in furniture is evidenced by the fact that they are receiving the most support and the closest co-operation from the shrewd, far-sighted dealers. To them this offers a means which, if taken full advantage of, will place the whole furniture industry on a new and higher plane, and, as a result, they are bending every effort to help.

There is a primal instinct implanted in the breast of every member of the human race, which demands a home. It may be more highly developed in some than in others, but it is there, like the Divine spark, which causes even the most ignorant savage to look to a Deity of some kind. This constitutes the raw material on which the manufacturers have to work. The desire for a home already exists and all that remains to do is to develop and strengthen it. That the public is in a receptive mood and is taking kindly to this campaign, cannot be disputed. The proof lies in the fact that each mail, since the advertising started, has brought in from thirty to forty letters containing 10 cents and a request for a portfolio containing reproductions of the complete series of advertisements. This in response to a small footnote appearing in each advertisement to the effect that such a porfolio will be forwarded on receipt of 10 cents. Just copies of a series of advertisements yet from thirty to forty people daily are sufficiently interested to remit a dime.

All this would seem to indicate that the time is ripe for a far-reaching campaign and that the results from such a publicity effort would be highly gratifying. It has been demonstrated time and again that regardless of general conditions and without respect to the attitude of the public, a publicity scheme carried out on a comprehensive scale and over an extended period, can mould the tastes and desires of the people at large and create a market for almost any product. The essentials are attractiveness of copy, breadth of scheme and persistency.

The campaign staged last fall was well conceived and well developed. The copy was attractive and struck home. Yet it did not reach its goal for lack of

Type of advertisements which are being run.

persistency. The effect of advertising is cumulative. The first appearance of an ad. or of one of a series, may not have any startling results, neither may the second or third, but each one has its effect and as the constant dropping of water will wear away the hardest stone, so will advertising, if persisted in, bring the desired results.

The campaign staged last fall was not carried through as a continuous publicity effort. Just when it was beginning to bring results, just when the attention of the public was beginning to be focussed on home furnishings, the advertising stopped. Had this been continued throughout the winter and spring, it would undoubtedly have meant many dollars in the

pocket of every furniture manufacturer. Will the same fate overtake the campaign which was launched a few weeks ago? Will it wither and die for lack of support? It would appear to be a mistake to plan a short campaign. It is so easy to drop it when the first push is over. Continuity of effort is necessary This can be obtained only when plans are laid far in advance. The American furniture men are planning a three-year drive and will not make a start until sufficient funds are forthcoming to complete the whole plan of campaign. That may be working unnecessarily far ahead but it is certainly not too early for the Canadian manufacturers to work and plan for 1922. Why not adopt the policy agreed on last year, namely, one per cent of sales, and continue the drive all through the coming year. Z. G. Simmons, Sam Karpen and others have staked their reputation on their belief that the sales of furniture can be doubled in the United States if all concerned will support their campaign. The same can be accomplished in Canada. One per cent of sales does not seem to be a very high price to pay when such large results are possible. Every furniture manufacturer should be a member of the Home Furnishings Bureau and lend his assistance in putting across the "Better or Furnished Homes" idea. Is 1922 to be a furniture year? Is it?

The Earned Hours Plan of Wage Payment

Is It the Fairest Way of Paying for Labor?—Has Advantages Over Ordinary Piece-Rate System—Rates Not Subject to Fluctuations.

By WM. SNAITH, C. E., Associate Engineer, Forest Products Engineering Co., Chicago.

In a previous article we have shown that the piece-work system is fudamentally more just than daywork, and that guesswork must be entirely eliminated from the calculation of piece rates. In practice this means that no rates should be set from past records as obtained from old-time tickets or cost records. Proper time studies with a stop watch in the hands of an experienced observer are the only satisfactory foundations for fair rates.

To rule out cost records as unsuitable data on which to base piece-rates, may occasion a certain amount of surprise. There may be some industries in which the operations are so simple that it would be possible to get cost records down to sufficient detail to be a valuable aid in the calculation of rates, but in most cases such records amount to nothing more than clever approximations, generally close enough for the purposes intended. A few comparisons of actual times required to perform an operation and the time called for by a rate based on proper time study, will convince anyone of this fact. It is the rule, rather than the exception, to find variations of 100 per cent. and on up to over 300 per cent. in the recorded time taken to turn out a given number of parts. Piece rates based on such records will, of course, be equally far astray.

Provides Fair Basis For Payment

It is not our purpose in this article to describe the various ways in which piece rates may be set from time studies. In another article we have outlined one such method based on fundamental principles which, on account of its accuracy and simplicity, is being adopted extensively. For our present purpose we shall assume that our rates are calculated and that we are installing a piece-work system. The next step is to decide on what the method of paying for the work which is to be done. The purpose of this article is to describe the advantages of the "earned hours" plan of wage payment. In several important particulars this method differs from straight piece-work, as that term is commonly understood. At the same time, lest someone might get the impression that an attempt was being made to present piece-work in an attractive disguise, a sugar-coated pill, as it were, let it be said that this is a piece-work system—the fairest way so far devised of paying for labor.

The "earned hours" plan is based on the idea of a certain amount of work being done in an hour. When this work has been performed the worker becomes entitled to an hour's pay. In practice the rates are set so as to contain an incentive varyying from 20 per cent. up. The result is that in eight or nine hours enough work can be done to earn ten or twelve earned hours. It is evident that this still leaves open the question as to how much wages shall be paid for the work in question. There are several very important advantages in this which will become apparent later.

Offers Opportunity For Increased Earnings

Three factors are involved in wages—the amount of work done, the time taken and the price paid. Of these factors, the last, the price or wages per hour, is a matter of bargain between employer and employee We need not here concern ourselves with the economic laws affecting changes in wages. It is enough to point out that, while wages per hour may fluctuate as a result of changing conditions or a new bargain between the two parties concerned, the "earned hours" rates remain unchanged. In other words, an operator agrees to run a certain machine for 50 cents an hour. Under the "earned hours" plan a certain amount of work is decided on as an hour's work and when this is done, the operator is credited with one hour. If the work is actually done in less than an hour, as it will be by an average good operator, he can make use of the remainder to earn a fraction of another hour. In cases where operators, perhaps in learning, come under the quantity set as the hour's work, they are guaranteed their hourly rate. In this respect the plan is a form of bonus system.

There is, however, an important difference between the "earned hours" plan and the elaborate bonus systems of Taylor and the like. It is as easily understood by the worker as by the office man, and there is no reason why each man in a plant accustomed to keeping count of the hours spent in the plant from one pay day to the next.

It is really essential to the success of any system of wage payment that the man who is doing the work shall be put to no trouble to know how much he is to get for doing it. This is not said in disparagement of the excellent bonus systems evolved by F. W. Taylor and others. Those systems cannot be applied in

the furniture business with its relatively small lots and numerous set-ups.

Not Subject To Fluctuation

The rates under the "earned hours" plan are thus seen to be subject to no fluctuations and to be easily understood and figured out. When once the number of pieces that can be planed or shaped or sanded in an hour underspecified conditions, has been properly determined, no change will be made in the rate unless the conditions are changed. If, to secure a finer finish, the feed is slowed down, the rate must be increased and vice versa if the feed is speeded up. These changes would, of course, not effect the actual wages of the operator although the quantity of work done would be changed.

Under straight piece-work every operator gets the same pay for the same work. In this way piece-work is a great leveller. The old employee who has given faithful service for many years gets no more than a new man who may stay but a month or a few days days if they both turn out the same quantity of work. Now, it may be difficult to prove that the old employee in such a case is actually worth more to a firm than the man who is here to-day and gone tomorrow. Yet there is strength in an organization which holds together and works together, and this sort of strength only old, tried and proved workers can give. The advantages may be intangible and in the stress of mushroom expansion may have been lost sight of at times, but it remains and the plant is fortunate where a fair proportion of the workers have grown up with it. In the "earned hours" plan the rate of wages paid to a newcomer need not be the same as that paid to old employees for the same kind of work. He can in all fairness be asked to take less on the understanding that length of service will be rewarded as time goes on. One of the few advantages of the daywork system is thus preserved in this.

Has Desirable Degree of Flexibility

Under straight piece-work an expert worker, a spindle carver, for example, may be temporarily out of work. The only other work available may carry a low piece price which would cut his earnings in two. If the policy of the plant is to do all possible to maintain continuous employment, the spindle carver under the "earned hours" plan would get paid at his regular rate for the hours earned on whatever the other work he was set at happened to be. This again is what would happen with day work. It is true that costs will fluctuate slightly under such conditions, but this will never be serious under normal conditions. As a matter of fact the cost records under any piece-work system are bound to be more accurate than with any other method.

The rates in the "earned hours" plan, being expressed in time only, really are the foundation for production control. It represents a very real economy in management when the one set of time tickets made out by the workers constitute all that is required in the matter of original record by the time-keeping, production and cost department.

The Foremen May Receive Benefits

The "earned hours" plan applies directly to those workers whose operations can be rated. The foremen, of course, cannot be put on piece-work. Now the foremen are the non-commissioned officers of the industrial army and it would be manifestly unfair when the privates are given an opportunity to increase their earnings that this should not be extended to the noncoms. Additional strength is lent this argument by the fact that more than anyone else the foreman can and does train his men so as to make them capable of earning extra pay. The "earned hours" plan is accordingly called on to provide a means to calculate the additional wages of the foremen, and it is found that this can be done very simply and in a very logical way. The time clock hours represent the time spent in the plant by the men in a department. The time tickets show the earned hours for the same period. Dividing the one into the other we obtain a measure of the efficiency of the department or the average extra pay of each man. The foreman's pay is, therefore, increased at the same rate. This may, perhaps, be put even more simply by saying that if the men of a department average 10 per cent. of extra pay, the foreman gets the same percentage added to his salary for the same period. Not only is justice done to the foreman under this method but the efficiency of his department is brought to his attention in a very compelling way and his efforts to build it up are rewarded automatically. A further result is secured in the creation of a healthy rivalry between departments for the best records. The interest in such a contest is not that of a man watching a score board. Each of the contestants is adding to his own pay envelope as he helps to better his own and his department's record. The effect on production need hardly be mentioned.

The "earned hours" plan is then fair to both employer and employee. It embodies the best features of the daywork system and removes the few slight objections to straight piece-work. It simplifies the work of the accountant and gives the management figures and results which lighten the burden carried in these days by those who direct industry.

Makes One Suit Only.

As an example of specialization in the manufacture of furniture, one might cite the case of the Period Cabinet Mfg. Co. of New Albany, Ind. This company was formed originally to manufacture phonograph cabinets, and while producing that line specialized in one cabinet in one wood, attaining a phenominally high production with correspondingly low production costs. When the demand for cabinets eased off, they turned their attention to furniture, and at the present time are producing one dining-room suite consisting of but four pieces. This suite is being placed on the market in two woods, walnut and mahogany, and a choice is being offered between two buffets.

In discussing this question the management of the Period Cabinet Mfg. Co. pointed out three primary advantages accruing from centring their efforts on the production of one suite. First—Increased efficiency of labor. The workman performs one operation on one size and shape all day long, a condition which materially increases his speed and skill. He does not become accustomed to one operation, only to be thrown off the track by having to change to another. Again, there is no loss of time while adjusting the machine to different sizes of work. Second—The floor space of the factory is used to its fullest capacity as the work moves along from one operation to another in a steady stream instead of being permitted to stand around occupying valuable space. Third—A saving is made in the amount of money tied up, as it is not necessary to keep large and varied stocks on hand to meet the demands which would be made were a varied line to be produced.

Wood Waste Receiving Special Attention

Special Section Formed at Forest Products Laboratory—Requirements of Chair and Wood Turning Industries to Receive Special Attention—Outline of Considerations Involved.

By ARTHUR T. UPSON, Forest Products Labratory, Madison, Wis.

"Industrial Investigation" is the name of a section recently organized at the Forest Products Laboratory, Madison, Wisconsin, to conduct a technical study on the efficiency of wood conversion processes with the idea of aiding in a more effective utilization of wood. In this connection a systematic survey will be made to determine the possibilities of a more complete utilization of by-products, low-grade material and wood waste produced in the logging and manufacturing of timber and in the manufacturing of wooden articles.

One of the first steps in this direction was the formation of a Wood Waste Exchange. The idea behind this is to supply a medium through which producers can locate markets for wood, mill and factory waste, and through which wood-consuming plants can locate such material of this character as will meet their requirements. The aim is to acquaint producers and consumers of waste material of one another's needs through quarterly reports. One report is entitled "Opportunities to Buy Waste," and contains the names and addresses of organizations which have marketable wastes for sale, while another report is called "Opportunities to Sell Waste," and gives the names and addresses plants which desire to buy all or a portion of their raw material in the form of waste.

Attempt to Standardize Requirements

Working in close touch with the Standardization Committee of the Association of Wood-using Industries considerable attention is to be devoted to a study of the dimension stock problem with the following specific purposes in view:—

1. To standardize the small dimension stock requirements of secondary wood-using industries.
2. To determine the most economical methods of converting the standing tree into the form of material required by these industries.
3. To accomplish the acceptance of these standardized dimensions requirements by the manufacturers of lumber and dimension stock and by consumer of such products.
4. To establish stable, continuous markets for dimension stock standardized in respect to nomanclature, size, grade and specification.

In order to concentrate this work as much as possible, activities are to be confined to not over two industries at a time. The two selected for the initial study are the chair and wood-turing groups. One reason why these two groups were chosen is that the requirements of both industries are of such a character as to lend themselves to standardization of requirements of wood stock and to the increased utilization of dimension stock in these industries.

Point to be Solved

The problem then resolves itself into individual studies of following character:—

1. Collection and compilation of data on the sizes and kinds of wood stock required in the manufacture of chairs of all general styles and in wood turning, and the standardization of these requirements by sizes and species.

2. Determination of the consumption of such stock, by sizes and species, in the chair and wood turning industries.

3. Detailed studies at representative chair and wood turning plants to obtain data on:

a. Cost of remanufacture of lumber into the dimension stock required, by species, by grades of lumber, by sizes of dimension, by purpose of stock.

b. Loss of material in such remanufacture, by species divided separately into waste in saw kerf, unavoidable waste due to natural defects, and avoidable waste due to artificial defects caused by improper handling and careless lumber manufacture, and to the use of lumber of sizes unsuitable to the manufacture of the dimension sizes in question.

4. Detailed studies at representative lumber manufacturing plants to obtain data on:

a. Cost of manufacture of lumber of the species and grades for the production of dimension stock similar to that studied as outlined under 3a.

b. Loss of material in such manufacture by species divided separately into waste in saw kerf, and in slabs, edgings, and trimmings combined.

c. Percentage of various grades of lumber produced, by species.

d. Approximate data on the amount of material wasted in slabs, edgings, and trimmings which is suitable for the manufacture of dimension stock, by species.

e. Cost of remanufacture of No. 2 and No. 3 common lumber into dimension stock, by species, and determination of the minimum grade which can be more profitably marketed as lumber than in the form of remanufactured dimension stock.

5. Detailed studies at representative chair and wood turning plants manufacturing dimension direct from the log and at mills manufacturing dimension for the market to obtain data on:

a. Cost of manufacture of dimension stock, by species and by grades, direct from logs, slabs, edging, etc.

b. Loss of material in such manufacture, by species, divided separately into waste in saw kerf, and in slabs, edgings, and trimmings combined.

6. Detailed studies at representative dimension mills to obtain data on the cost and most economical method of:

a. Handling dimension stock from the saw.

b. Sorting dimension stock separately as to species, sizes, and grades.

C. Handling dimension stock from sorting room to yard, kiln, or car.

d. Piling dimension stock for air drying and in kilns, by sizes and by species.

e. Air seasoning and kiln drying dimension stock.

f. Kiln drying at mills vs. facories.

7. Compilation of list of present mills producing dimension stock including data on the:

a. Name of owner and location of mill.

b. Amount of stock produced annually.

c. Species.

d. Condition of stock, i. e., green, air dried, or kiln dried.

e. Material from which manufactured.

Certain other studies must be conducted later on to bring about the complete solution of the problem, but they cannot be handled the present fiscal year.

In this work the Forest Products Laboratory earnestly solicits the closest co-operation of all wood-turners and chair manufacturers, in order that results will be obtained of greatest mutual benefit to both industries, as well as to the public in the light of progress in forest conservation.

Exhaust Systems for Woodworking Plants

What a Shavings Exhaust Should do—Will Make Handsome Returns if Properly Designed—Air Velocities for Planing Mill Work—Many Nice Problems Involved.

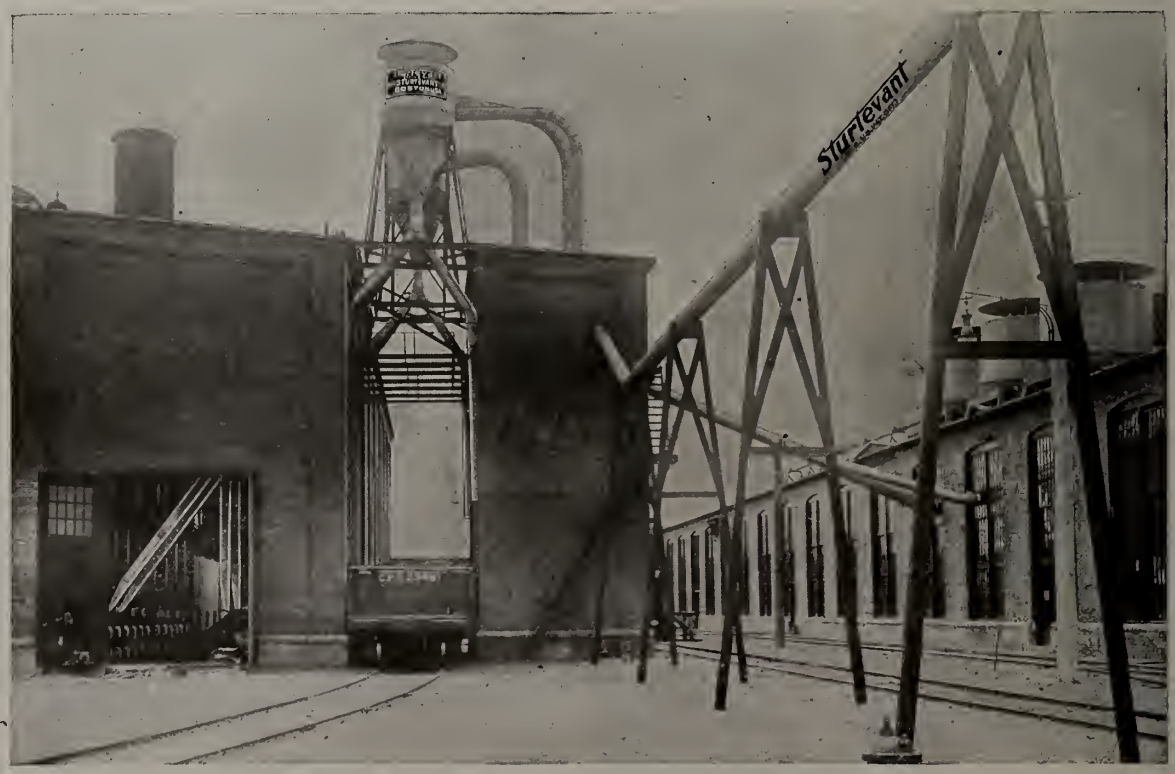
By H. M. Nichols, B. F. Sturtevant Company, Boston.

The first practical application of an exhaust fan to the collecting and conveying of dust and refuse materials was made in the early sixties and was the outcome of a shoe buffing machine invented by B. F. Sturtevant. Such a cloud of dust was stirred up when this buffing machine was in operation that the workmen complained and objected to its use. Mr. Sturtevant in his search for a remedy for this condition built a small exhaust fan which he connected to the buffing wheels by means of a sheet metal hood. He found that this exhaust fan drew away the particles of leather and left the air in the room clean and healthful, and thus came into being the first satisfactory exhaust system, and the father of all the exhaust systems in use to-day.

In wood-working plants a properly designed and well installed exhaust or "blow-pipe" system as it is often called, not only adds to the comfort and safety of the workmen but it can actually be made to pay the manufacturer large dividends on its cost. Modern high speed wood-working machines produce such tremendous quantities of shavings, chips, and sawdust that unless this waste material is removed by a suction system, as fast as it is made, it soon clutters up the machines and surrounding floor space, thus necessitating frequent stops to clean the machines and clear away the piles of refuse.

Will Return Nice Dividends

Eliminating this labor item and increasing production through continuous operation of the machines are two of the dividends which the manufacturer obtains from an efficient exhaust system. Also where there is a market for either shavings or sawdust the collector can be arranged to automatically separate these materials so they can be sold. And if there is no market for the refuse it can be automatically delivered to the boilers and used in place of coal for fuel. Then again unless this light and bulky refuse is removed from the building as fast as produced it constitutes an ever present and menacing fire hazard. Ac-



Dust Collectors and Furnace Feeders at Angus Shops of C. P. R., Montreal. Collectors in the center deliver shavings either to furnaces, box cars, or storage vaults

cidents are reduced by keeping the floors and working spaces clear of litter, by preventing injuries from flying chips, and by avoiding the necessity of cleaning the machines while in operation. The removal of the dust which is always irritating and sometimes poisonous, improves the health, efficiency and production of the workers.. Insurance premiums, both fire and liability, are reduced where cleanliness prevails.

However, for the exhaust system to show these marked advantages in the wood-working shop, it must satisfy a much more exacting set of requirements than the ordinary dust collecting system, as it must not only remove the light dust as required of the common dust system, but it must also carry away the vast quantity of chips and shavings which are discharged in steady streams by the rapidly revolving cutters, and any faiure to handle these streams of refuse as fast as they are thrown from the knives results in the immediate stoppage of the part of the system at fault.

Points to Consider

In addition to handling the refuse material without interruption, a properly designed exhaust system should also fulfill the following requirements:—

(1) It should not interfere with the operation of the machine or access to working parts.

(2) Hoods and piping should not obstruct the room or interfere with the movements of the workmen.

(3) Should not increase the fire risk.

(4) Where power is costly should do the work with a minimum amount of power.

(5) In cold climates should not remove any more air than necessary from the building.

(6) Where power is cheap first cost should be low, even if the power to operate is slightly higher.

There are two general types of installations, the central and the group systems. In the central system a single or double fan is located near the center of the shop with a piping system radiating from this central point to the wood-working machines. In the group system, which is sometimes employed where the machines to be served are widely scattered, small individual fans are located at the center of the machine groups. The exhaust from the various fans usually being conducted to a single collector.

The group arrangement is more difficult to balance than the central, and also the large number of small diameter trunk pipes required show a much higher friction loss per foot of length than with the central system where one large main pipe serves a considerable number of machines.

Many Special Problems Involved

Each installation of a shavings and sawdust collecting system presents special problems. Certain quantities must be chosen arbitrarily by the designer and the success of the installation depends largely on his experience and the skill with which he chooses these arbitrary quantities. It is quite possible for an inexperienced designer to lay out a system which will apparently work properly, but the general results are likely to be unsatisfactory.

Before attempting to lay out a system of this kind it is necessary to have a clear understanding of the requirements of the particular shop in question, i. e. it is necessary to know the type of shop, the class of work which they are doing, kind of lumber handled, as well as the sizes, types, capacities and location of the machines, also whether the refuse material will be burned in the furnaces or separated and sold, and whether the system is to be designed for minimum power consumption or minimum first cost, as well as many other factors, which usually requires that a study be made in the field in order to determine all these points.

After obtaining a clear understanding of the requirements of the particular job in question the next step in laying out the system is to determine the number and size of connections for each individual machine. At this point the designer's past experience is of great value, as while it is possible to set certain general standards, yet in actual practice the sizes are considerably affected by the local conditions which the layout man finds in the field, and he bases the pipe sizes on his judgment being guided by his experience and the general practice. The size of connections will vary with the quantity of shavings made, kind of lumber, its condition, whether wet or dry, speed of the cutter heads, etc. and while we can give a table of connections which are often used, yet experience will best dictate just what sizes are best for a given job.

Dust collector, showing dual feed, R. Laidlaw Lumber Co., Toronto. Installed by Toronto Blower Co.

The main pipes, which vary in diameter, increasing from the dead ends towards the fan, are usually made of such size that the area at any point will be 20 to 25% in excess of the sum of the areas of the branches entering between the point in question and the dead ends of the mains. Floor sweeps, if equipped with efficient blast gates, are not included in determining this area.

Velocities Commonly Employed

Another method of determining the size of the main trunks is to figure them such as to keep a given air velocity through their length. In planing mill work velocities from 2500 to 5000 feet per minute are used. Velocities commonly employed are:

Light shavings and sawdust from dry wood 2500 to 3000 feet per minute.

Heavy shavings and sawdust from wet wood 3000 to 4000 feet per minute.

Hog waste, pulp chips and similar materials 4000 to 5000 feet per minute.

Treatment of Depreciation in Production

Not Considered by Many Manufacturers—Will Take Toll of Profits Unless Provision is Made—Should be included in Factory Costs

By E. W. McCULLOUGH, Manager, Fabricated Production Department, Chamber of Commerce, Wash.

These facts concerning depreciation are still reflected on the books of many manufacturers: (1) Depreciation not charged, or charged inconsistently (2) Depreciation not taken into current, every-day costs. (3) A confusion of different points of view; depreciation for cost and accounting purposes confused with possible realization and replacement values. (4) Wear and tear hastened by inadequate maintenance and careless shop practices.
(5) The effect of obsolescence underestimated. (6) Depreciation computed by rule-of-thumb rates regardless of the experiences of plant or industry. (7) Depreciation poorly accounted for; the reserve for depreciation misused, general failure to distinguish repairs from betterments and renewals. (8) Depreciation inadequately recorded, little segregation or classification of property, the property ledger used sparingly.

Depreciation attempts to measure the effect of time and production on physical properties and equipment and to record results in dollars and cents. This computation cannot be exact because the elements affecting depreciation are many and their relative importance difficult to determne. The use and character of property, its maintenance, the quality of installation, and often local conditions variously modify the life of property, while an unexpected industrial advance may suddenly terminate the usefulness of property and completely upset depreciation calculations.

Cannot Be Avoided

One fact concerning depreciation is certain—it can be postponed but not ultimately avoided. All your plant and equipment suffer from and finally succumb to depreciation. To the end that this loss may be reasonably controlled and fully reclaimed in manufacturing costs this study of depreciation is directed.

Depreciation is an inescapable cost of doing business to be provided for by a regular charge to current operations. Every thousand of brick produced, every case of shoes manufactured, every fashioning of metal and turning of wood, each twist of the handle and blow of the hammer helps to wear out your plant and equipment, and the particular job or process that causes this loss should bear the cost.

Analyze the costs of almost any group of manufacturers marketing the same product and you will detect two kinds of differences; one real, the other accidental. Real differences in cost arise from superior management, higher productivity and better disposition and utilization of capital, etc. Such differences are the very breath and life of business.

The accidental differences are due to the failure on the part of manufacturers to include all the proper and legitimate items of expense in costs, an improper distribution of overhead, etc., and differences of this nature make for business unsettlement. One such accidental difference in costs most frequently found arises where manufacturers do not charge depreciation at all or leave depreciation to be dealt with at the end of the year.

May Absorb Profits If Not Recognized

The business man who does not charge depreciation at all is fooling himself. He is making no provision for the inevitable day when his property must be scrapped. His supposed profits may in fact be a distribution of his capital.

The business man who waits until the end of the year to detrmine his depreciation according to the size of his profits may make the discovery that he has no profits, since he has consistently sold his product upon a cost that was incorrect.—a cost that did not include such a necessary expense of manufacture as depreciation.

The competition of the future should be an informed competition. The basis of lower prices should be a greater efficiency, not incomplete costs. To that end, everything that goes through your factory should bear its proportional cost of depreciation. Charge depreciation into current costs.

Is Not Resale Value

Depreciation for cost purposes is not concerned with resale or replacement values but aims to recover the cost of assets, less any salvage. The need arises from the fact that working assets gradually give out or become obsolete. They are, in fact, used up in production. Were the assets consumed in any one year their entire cost would be written off during that year, but the process of depreciation is slow, usually extending over a period of years. Hence it is unfair to charge off all the cost in any one year.

It is frequently declared that the moment a machine or piece of equipment enters a plant it becomes second-hand and at once loses a considerable share of the original cost, and it is asserted that this loss of value should be reflected on the books by a sizeable first charge for depreciation. But we are not concerned primarily with what property will bring, its resale value, but how property is used up. The test for depreciation is how long the property will function, how many units it will produce before scrapping time. Just as the meter notes the flow of current, so depreciation seeks to register in costs the gradual loss of usefulness of plant and equipment. This loss of usefulness is an inc dent of time and service and is unaffected by the rise or fall of prices or the possible loss in resale value after purchase.

When the cost of an asset, less any salvage value has been recovered, the process of depreciation stops —the consumer has paid for that particular item of service. There are those who maintain that the obligation of the consumer is rather one of replacement —building for building, machine for machine. According to this view depreciation should be based on replacement cost rather than actual cost.

Replacement Value Next Factor

The replacement theory substitutes for something certain and definite, the actual cost, a cost of reproduction which is highly speculative and conjectural and requiring frequent revision. It, moreover, seeks to estblish for one expense a basis of computation

fundamentally different from that used for the other expenses of doing business. Insurance is charged on a basis of actual premiums paid, not on the basis of probable premiums three years hence; rent on the amount actually paid, not on the problematical rate of the next lease; salaries, light, heat, power, supplies are all charged at actual, not upon a future contingent, cost.

As one writer has expressed it, "The fact that the plant cannot be replaced at the same cost, but only at much more, has nothing to do with the cost of its product, but only with the cost of future product turned out by the subsequent plant." As the product goes through your factory it should be burdened with expired, not anticipated, costs.

Charge depreciation upon actual cost less any salvage. Resale and replacement values have uses of their own. Stockholders may desire to know what can be realized on plant and equipment upon liquidation, and for such the resale value of the assets is important information. Replacement costs govern the settlement of fire losses, for the contract of fire loss is one of indemnity. Neither original costs nor the accountant's depreciation govern settlement. Indemnity is determined by the actual cash value of the property at the time of the fire, with proper deduction for depreciation however caused.

Is Only An Estimate

But the depreciation must have materialized irrespective of any provision on the books of the company. In setting his charge for depreciation the accountant may allow for a factor of obsolescence which may not develope by the time of the fire or he may assume an even and uniform loss from wear and tear over a period of years or upon an incidence of production, whereas the actual wear and tear may be uneven and unexpected, slower or more rapid. This state of facts has led a writer on depreciation, in reviewing the relationship of depreciation to fire losses, to state:

"Depreciation is after all but an estimate of what may be necessary to meet contingencies, some of them of a speculative kind, and as the losses provided against may have been escaped, a review of all the circumstances so far as they can be ascertained may show a higher value than is stated in accounts drawn up for a different purpose; and, again, where plant has been regularly written down, it does not follow that only the value as so lessened can be claimed (in a fire loss).

Depreciation and Fire Insurance

As an outgrowth of this study of depreciation an attempt has been made to ascertain the attitude, general theory and rule of fire insurance companies toward depreciation, also to learn what weight was given to reserves for depreciation accumulated on the books of the assured, whether there was a wide recognition of the fact that depreciation is charged for contingencies which may or may not have taken place at a given time; for example, that obsolescence provided for may not have been realized.

The results of this inquiry are not conclusive. There is some confusion of thought and some actual differences in practice, but the following is fairly clear and certain concerning the attitude of fire insurance companies toward depreciation.

The provision of a Standard Fire Insurance Policy under which the right to "Depreciation" is exercised, is as follows:

"This policy shall not be liable beyond the actual cash value of the property at the time any loss or damage occurs, and the loss or damage shall be ascertained or estimated according to such actual cash value, with proper deduction for depreciation however caused, and shall in no event exceed what it would then cost the insured to repair or replace the same with material of like kind and quality."

"The obvious purpose," to quote an insurance adjuster, "of the contract of insurance is indemnity regardless of the loss of time, of inconvenience, of annoyance, or consequential injury or damage to the business of the assured."

(Continued in December issue)

How Much Should This Sash Cost?

Test Submitted to Number of Woodworkers Reveals Startling Condition—No Wonder General Public Views Woodwork Prices with Uncertainty

When will the woodworking industry get down to some nearly uniform basis on which to make estimates and quotations? Competitive bids are taken on a job and as a rule the figgures submitted show a substantial variation, the order usually going to the lowest tenderer. Of those who quoted, some guess that the successful bidder is going to lose money, while, perhaps, a few know that he accepted the order at too low a figure, and all remain more or less in the dark.

A member of the Southern Sash, Door & Millwork Manufacturers' Association recently submitted cost figures covering a store sash he had made to order, sketch of which is shown in the accompanying illustration. C. B. Harman, secretary of the above Association, immediately asked his membership to submit their estimates of cost and labor on the job in question. He received thirty-two replies and the variations in the estimates submitted would appear to indicate that there is too much "guessing" and not enough "knowing" and that guessing is a poor substitute for scientific estimating.

Mr. Harman's report is as follows:—One store sash, 8 ft. 6in. x 12 ft. 8 in. x 1¾ in. OPEN—3 lights top with panel at bottom as per detail submitted. Made of heart yellow pine or heart cypress. The member who made and sold this sash has given me the following cost, made of heart pine.

63½ ft. Lumber	$2.88
Machine Labor and Burden 4.4 hours	5.32
Bench Labor and Burden 4.8 hours	4.08
Factory Cost	12.28
Commercial Burden 15%	1.84
Actual Cost	$14.12

He took the order on time and material basis and charged $16.50 for it, giving him a profit of $2.38 or

16.8%. He doesn't seem to have added anything for waste of lumber as the price figured for lumber is slightly under $47.00 per M and we don't know where heart pine lumber suitable for the purpose can be bought at that figure.

Of the estimates made on the sash, O. P. Makepeace of Sanford Sash & Blind Co., Sanford, N.C., has turned in the closest figure nearest the cost. His figure is $14.18, just .06 cents more than the cost. C. R. Preddy of Builders Sash & Door Co., Rocky Mount, N. C., comes nearest to the amount of labor repuired, he estimates 9 hours when it took 9 1/5 hours.

And now come the fireworks, a very remarkable showing, you will admit:

LIST OF ESTIMATES TURNED IN.

Factory	Cost	Labor
1	$30.50	13 hrs.
2	26.00	12 hrs.
3	23.65	12 hrs.
4	23.40	10 hrs.
5	22.20	9½ hrs.
6	22.18	7 2/3 hrs.
7	21.10	6¾ hrs.
8	20.06	4½ hrs.
9	19.55	10½ hrs.
10	18.08	7 hrs.
11	17.70	5½ hrs.
12	15.99	8 hrs.
13	15.75	3¼ hrs.
14	14.18	5 hrs.
15	13.65	10 hrs.
16	13.30	6 hrs.
17	13.29	5 8/10 hrs.
18	12.98	9 hrs.
19	12.85	9 hrs.
20	12.28	6½ hrs.
21	12.06	6 hrs.
22	11.10	3½ hrs.
23	11.06	3 hrs.
24	11.06	5 hrs.
25	11.88	4½ hrs.
26	11.91	5 hrs.
27	10.90	4¼ hrs.
28	10.54	6 4/10 hrs.
29	9.60	5 hrs.
30	8.52	6 hrs.
31	8.34	2 hrs.
32	5.70	4 hrs.

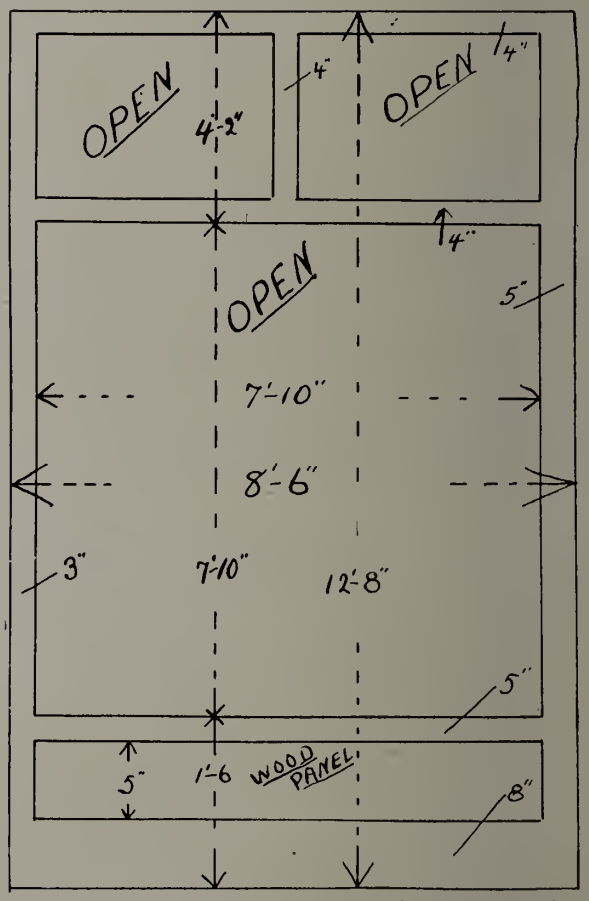
If this means anything at all, it is that there are very few who can estimate the amount of labor with any degree of certainty or accuracy. It will be noted that only 8 men have figured sufficient labor, all the other 24 have underestimated. Note also that the price runs from $5.70 to $30.50. Could this occur if we "knew our business" or were better posted about our labor? One man figures 2 hours and another 13 hours; my, my, men! the old well digger who used to find where the water was with a peach tree switch could beat us "all holler."

We didn't expect everybody to figure the same price for we knew that was impossible, but we are amazed at these very large and wide differences. What would a customer think and feel, who had paid $30.50 for the sash if he found that he could have sent down to Georgia and got it for $5.70? It wouldn't put a very good taste in his mouth. This test should show and convince you that the method of guessing or approximating labor was impossible and that present conditions will never be better until you keep cost and fill up your files with records to refer to quickly.

Labor is the most dangerous element we have to contend with as your accountants and auditors or others who are familiar with the millwork and lumber business can easily figure what your burdens or overhead expenses are.

Now, the factory that made the sash is only a medium size one and in writing he admits that many of our other factories might have produced the sash more cheaply and that his men made a slight error in mortising, but that does not explain the ridiculous situation presented to us through the foregoing exposition of cost and labor by 32 different men.

Its no reflection on an estimator's ability when he takes sufficient time to figure the cost of anything—these "lightning" or fast putting down figures men are dangerous and mean big losses to many times when you never know anything of it and often times put you in the position of charging your customers altogether too much. It is more practical and better business to take half an hour to make up the list at a cost of from $1.00 to $2.00, than to lose two, three



Sketch of store sash on which quotations were asked

or four times that much on the sale price, or to overcharge your customer beyond reason.

The "Canadian Woodworker" submitted the same question to a number of woodworkers in Canada but the response was not general enough upon which to base any conclusions. Three replies were received and naturally there was the usual variation. One estimated $10.35 allowing 2½ hours work. Another figured $13.20 with 3½ hours while the third submitted $17.80 and 6 hours.

How a Construction Revival Can Relieve Unemployment

A Memorandum Submitted to the Recent Unemployment Conference Held at Washington, D. C., Analyzes the Present Building Situation and Suggests Measures to Keep Things Moving

By R. C. MARSHALL, General Manager, Associated General Contractors of America

In the present situation the well-known slogan "build public works in times of depression" is again advocated, and this principle should be carefully investigated, to determine its possibilities as a remedy for unemployment. If construction in conjunction with other measures is advisable, the ground should be cleared for putting it under way. But before such action can be successfully carried out, the co-operation of public officials, industrial leaders, and the public at large must be secured. This means that they must see exactly how construction is able to give relief.

To show the feasibility of starting industrial recovery and giving employment by inaugurating construction (both public and private work), an analysis of the five fundamental factors is prsented. They are:

1. Dependence of other industries upon construction for a market.
2. Present shortage and the demand for construction.
3. Capacity to increase employment.
4. Causes delaying construction.
5. Steps necessary to revive construction.

The factors vitally affecting the present unemployment emergency are here briefly outlined.

Dependence of Other Industries

Construction holds the position of a key industry through which the products of some forty other industries find their way to a consumer, and the innumerable items of materials and equipment produced by them converge to a narrow outlet, governed by construction operations. Therefore, when these operations are stopped they block the outlet for hundreds of products and intensify in the basic industries the effect of unemployment.

Steel and lumber production especially suffer when construction becomes stagnant. Before either of these can again give employment to the usual number of men, orders for structural members, lumber and other products used in the many branches of construction must be received. This principle acts also in all of the 40 basic industries, and in these industries more than in construction itself, the capacity to provide employment lies.

Present Shortage of Construction

There is a potential demand for both private and public works, which can by proper action be converted into a commercial demand for materials and labor, a value upon which has been placed by numerous agencies. Reliable statistics for such estimates are meager, but the main items of these various estimates show close agreement. The need for mercantile and industrial buildings which is obviously synchronized with the trade cycle is low. But the requirements of housing, public utilities, and various types of public works undoubtedly need an intensified building program for several years to come. The railways, according to Mr. E. H. Harriman's estimate some years ago, lacked construction to the amount of five billions, practically none of which has yet been attempted. An immense expenditure represents the needs of our public utilities, and according to the plans laid for highway development, a vast amount is needed for public roads.

Capacity to Increase Employment

The number of employes in the basic industries engaged in producing construction materials, products and equipment was recently estimated by the United States Chamber of Commerce to be one-fourth of the employes engaged in manufacturing and mechanical work. Probably one-eighth of those in mining and transportation also depend upon construction. If these figures, commonly accepted in the absence of accurate statistics, are correct, the ratio between labor in the basic industries and in construction is about two and one-half to one. This indicates that when two men are set to work in the field, seven men are employed in the whole construction group.

In the present emergency not only the number of men, but also the time required to place them at work, is important. For an estimate of this we can rely only upon the judgment of men experienced in construction operations.

Seasonal considerations and the lack of preparation in matters of design and plans make it impossible to start immediately all work for which public appropriations have been provided. But if a major part of this work is started in November, if this conference can influence private agencies also to start work by then, it is estimated that within 90 days employment could be found for nearly a million men.

[This, of course, applies to the U. S.—Editor.]

Both private and public work have been delayed primarily on account of high construction cost. This cost has been brought about, not only by advance cost of labor and material, but also by increased freight rates and heavy financial charges.

Labor and Materials

Government index building material prices reached a level of 341 in 1920, while construction labor advanced to the index of approximately 230. Comprehensive figures are not available, but both of these are believed now to be in the neighborhood of 160, though union labor is higher. It should be remembered, however, in considering these index numbers, that prices were steadily increasing before the war at the rate of 2½ per cent. a year and would probably have landed without the war at what is now 120. The present level is, therefore, some 40 points above what we would choose to designate a normal. The index of finished construction, as indicated by industrial buildings, stood between 160 and 170 in July, and is now between 150 and 160. The index curve has stopped its descent and immediate deflation is apparently at an end.

It should be noted that wages have kept in step with

the per capita increase of money. Whether this relation must necessarily continue is a mooted question, but as the present per capita wealth is some 60 per cent. above that of 1914, it appears that a wage level of 160, as predicted over a year ago by one economist, is at a stabilizing point. In any event, upon this index principally depends any great reduction of cost. Any saving that might be made by lower labor and materials cost will undoubtedly be insignificant compared with the expense of any system of charity or doles that might be necessitated by further postponement of work.

If construction is delayed until producers in the basic industries are driven out, recurrence of the situation of 1920 may be expected. The supply of material will be so slow that prices may move rapidly upward when revival does take place. We shall doubtless be forced to look outside the field of actual labor and materials cost to find a means of bringing about the immediate reduction which will influence the demand for construction in the present emergency.

Freight Rates

Freight rates on bulky construction materials are a significant factor of increased costs. Their present level has not altogether discouraged shipping and construction, but has in some localities practically killed the aggregate market. Rate discrimination against construction materials was made by the Railway Administration during the war, and on top of its purposely prohibitory rates the last horizontal increase was added. These rates have placed the transportation cost of materials on an 18-ft. concrete highway as high as $11,000 per mile. In specific localities the rates are as much as 129 per cent. above the 1917 charges. They are unduly keeping up the cost of construction and preventing its revival.

Financing Charges

In every section of the country owners have declined to start new projects on account of financing charges. Both the interest rate and the premium paid for floating loans are discouragingly high. Premiums for floating loans, varying between 10 and 20 per cent., are charged in addition to 7 or 8 per cent. interest. For example, before the first work of construction was begun, the owners on a well-known Washington apartment house were required to pay for the $1,250,000 involved an interest rate of 7 per cent., a bond premium of 1½ per cent. and a floating charge of 10 per cent., making the total financing charges 18½ per cent. Financing charges on a subsequent loan of $250,000 for the same structure were $75,000. This is a charge of 30 per cent. It is doubtful whether the architect, the contractor and the producers in the basic industries made a profit all combined equal to these financing charges. When an owner must pay such a sum before construction even starts, many projects are postponed or abandoned. Before private work can proceed as needed, some relief from conditions must be secured.

Steps for Reviving Construction

Certain direct action which will open up employment through construction can be taken by the government, while through regulatory action and example it can both stimulate the demand for construction and influence other agencies to act. The following steps to bring about activity in both private and public works are suggested:

(a) Place under construction as soon as possible all federal public work for which appropriations are already made, at the same time urging state, county and municipal bodies to do likewise. In doing this the federal authorities should adhere to existing precedents for administering public works, especially public roads. The efficiency and ability of the bureau of public roads, which have been thoroughly demonstrated and have secured the confidence and co-operation of the states, must not be wasted by vesting construction administration in some other agency. Economical road building requires the specialized engineering ability now centralized in the bureau of public roads.

(b) Enact any necessary appropriations that are already contemplated.

(c) Establish some form of home loan agency, possibly using the postal savings funds, to furnish money at reasonable rates for housing construction, making it possible for the agency to co-operate financially with reliable building and loan associations. Financiers will not turn from attractive foreign loans to place money in construction at lower rates of interest.

(d) Adjust any freight rates on materials that are eliminating markets or causing unreasonable charges on construction materials.

(e) Make payments of claims due the railways and settle other existing claims so that these agencies can undertake immediate improvement and new work.

(f) Push investigations of unlawful or injurious combinations and agreements in finance, building and materials production.

(g) Encourage private agencies by tax exemption to start their projects in the near future; this plan advocated by Senator Calder proved successful in increasing housing facilities in New York. Also advocate drawing contracts to give such owners the benefit of price reduction.

(h) Place the federal power commission in a state to function properly so that private power prospects can be passed upon and put under way.

The factors here mentioned are viewed from the standpoint of construction, and obviously any action pertaining to them must be taken with due consideration for the entire economic situation. We know, for instance, that the railroads must be allowed to rehabilitate themselves and that to do so they must operate at a profit. But in the event that stimulation of construction, either private or public, is brought about by this unemployment conference, such stimulation may be relied upon to aid effectively the present situation.

However, before artificial stimulation is attempted, one vital contingency must be taken into account. This is the effect of sudden expansion upon construction material prices. Unless constructors, material producers and labor are willing in this emergency to accept reasonable profit and reasonable wages, any intensified construction program may end in disaster. If the supply and demand for construction service, materials and labor are permitted to constitute the sole governor of prices, a situation analogous to that of 1920 may reoccur. Since we cannot and should not attempt to arbitrarily regulate prices, assurance of reasonable prices must come from two sources. These are first, the far-sightedness of industrial leaders who know the ultimate benefit of steady prices, wages and markets; and second, the force of public opinion. It is with these considerations in mind that stimulation of construction is recommended.

Not Much Chance of a Fire in This Plant

Outline of Measures and Precautions Taken to Prevent Outbreak of Fire—Cleanliness Important Factor — Fire insurance Inspector Pronounces Factory Cleanest in District.

By W. WARREN

Fire protection is assuredly of first importance, especially so to the owner of large stocks of inflammable material, such as lumber. As manager of a large retail lumber yard, mill and woodworking factory, I have been compelled to make a careful study of the causes of fires, and the most practical way to institute preventative measures. Prevention is better than cure.

It is not possible to remove all and every contributary cause, but it is possible to reduce them to a minimum. Ther are few conditions so admirably adapted to the general requirements of a conflagration as a lumber yard covering ten acres and containing 10,000,000 ft. of lumber, with all the requisite buildings filled with very inflammable material.

Have Efficiently Trained Squad

We have a very efficient fire squad under the leadership of our factory superintendent. It is a body of some fifteen carefully hand-picked men, well trained and noted for their efficiency and loyalty, and whilst these men are qualified fire fighters, every opportunity is used to instill into their minds that the proper time to fight a fire is before it starts. These men being drafted from all departments, their influence is felt throughout our whole organization and so all our employees automatically become fire preventers. Let me say in passing that no manager or executive head can effectively control a situation of such vital importance as fire prevention unless he seeks the assistance of his whole staff and gives due credit for same.

We can and do supply numerous devices calculated to put out a fire, and we flatter ourselves that our equipment is fairly complete, but all this paraphernalia without the necessary prevention, effectively and rigidly adhered to, will benefit very little.

Cleanliness First Requisite

Fire in a lumber yard is the most devastating demon that can possibly visit it. A yard should be laid out so that no blind ends exist, every lumber pile should be easily accessible and roads and alleys clean at all times, so that reel and trucks can reach any desired position. Any material left standing on any of our roads will be found on carts, trucks or wagons. Nothing is allowed to be stacked, or piled down where a blockade may occur. An infringement of this rule results in the dismissal of the responsible party.

Cleanliness is one of the most powerful factors in fire prevention. No papers, dead or dried grass, weeds or shavings, are allowed to remain within the precincts of the yard. A capable caretaker, whose duties are solely that of a clean-up man, is kept continually gathering up grass, straw, strips, paper or any other inflammable refuse.

At convenient points high pressure hydrants have been placed, with lines of hose capable of reaching any position around the yard. Barrels and buckets are placed in conspicuous places, whilst parts not supplied thus are equipped with approved chemical extinguishers. The watchman's stations, phones and general fire alarm signals are placed in very prominent places. Care is taken to leave all automobiles and trucks clear of lumber piles.

Special Hazard in Mill and Factory

The mill and factory call for somewhat different treatment and special care. There is at all times the possibility of hot boxes, sparks, short circuits, spontaneous combustion, etc. Here, as in the yard, cleanliness is the biggest factor in fire prevention. It is impossible to keep a factory or mill clean unless it is equipped with an up-to-date blower system, thereby removing all sawdust and shavings, delivering them either to the boilers or shaving vault.

Competent clean-up men are very necessary, and only men with housekeeping qualifications should be employed for this purpose. No refuse should be allowed to remain on a factory floor over night. Oil from line shaft, pulleys, motors, etc., may mingle with the sawdust or small shavings, thereby setting up spontaneous combustion. Statistics show that a large percentage of fires start from this cause. In our factory the clean-up man's work is even more carefully inspected than the orders passing through the plant. Let me state in passing that the fire insurance inspector has pronounced our plant the cleanest in his jurisdiction.

Oil Soaked Shavings Removed Daily

We exercise especial care in cleaning machines of all dirt, grease, and oil, and under no circumstances is an accumulation of this combustible refuse allowed to collect under a machine. I once experienced a fire started by the sun playing on oily sawdust gathered under a machine. In the event of a bearing becoming over-heated, it is duly reported to the nightwatchman, who inspects same at short intervals until all danger is passed. As in the yard we do not allow any material to be stacked on the floor, but all stock kept on factory trucks until ready for shipment. In the event of an outbreak, the affected area can be cleared quickly.

One of the most dangerous practices is that of having racks placed around the factory. Once a fire commences to travel through a rack filled with inflammable strips, the building is practically doomed. It is next to impossible to check it. All supplies, such as moulding, rippings, etc., should be removed into a closed room adjacent to the plant, where the chances of a fire are remote, and where, if one did break out, it could be localized.

Mechanical Equipment Not Overlooked

Our mill and factory fire protection consists of a sprinkler system, 4 lines of hose capable of reaching any part of the building, several water barrels, sand pails, also chemical extinguishers. Our glue room, dry kilns, shaving vault and boiler room are all equipped with steam jets direct from boilers, this being without doubt one of the surest and least destructive methods of checking a fire in a confined area.

Our gasoline is stored underground, whilst all oils are kept in approved metal containers, and every pre-

caution taken to reduce the fire risk to a minimum, but all this, without the intelligent co-operation of the whole staff, will be of little value. Our men are taught that they would suffer loss and inconvenience in like proportion to the firm, if the plant was wiped out by fire, and so we endeavor to spread the responsibility, making each employee bear his share, thereby keeping fire prevention a live question.

Steaming Before and During Kiln-Drying

Why Resort is Made to Steaming—How Casehardening and Other Strains May be Relieved —A Few Don'ts for the Seasoning Process

By W. K. LOUGHBOROUGH

Forest Products Laboratory, Madison, Wisconsin.

When either water or steam at high temperatures comes in contact with wood, the wood substance is made plastic. The softening effect increases as the temperature increases, but the ratio is not known. While it is true that wood is very weak when hot and wet, it is not apparent that this weakening effect exists after the wood becomes dry. The weakening effect exists after the wood becomes dry. The penetration of the moisture from steam is greater at high kiln temperatures and low moisture content of wood than at lower temperatures and higher moisture content, partly because the vapor pressure on the outside of wood is made higher than the vapor pressure inside. This fact necessitates the use of live steam rather than exhaust for this purpose. When free water is present in the centre portion of the stick, the internal vapor pressure is practically the same as that of the outside air during a process of steaming. In this case any portions between the inside and outside which are of low moisture content or below the fibre saturation point are affected by thee ombined high vapor pressure of the inside and outside. The moisture content of this portion is thus increased by the increase in vapor pressure. The softening effect on the fibres in this intermediate zone must depend on the transfusion of the internal moisture inasmuch as it takes a long time for water vapor (not the heat) from the surface to penetrate through wood even though the wood and vapor are hot. For example, it took six days of constant steaming at 165 degrees Fahrenheit and 100 per cent. humidity to raise the moisture content in the centre of 2½-in white ash form 7.4 per cent. to 19.1 per cent. After 36 hours the centre had been raised 2.9 per cent .

Purpose of Steaming and Conditioning Treatment

Steam as understood in the art of kiln drying is space saturated with water vapor at any temperature. Steam is made use of because of the softening effect it has on wood fibres and because it makes it possible to supply the wood with heat without causing evaporation. These two qualities of steam are made use of in kiln drying to prevent and remedy many seasoning defects. It should not be resorted to indiscriminately as a cure of all the ill-effects resulting from seasoning, although through its judicious use many defects of kiln drying may be eliminated. Steaming may in fact cause ill-effects at certain stages in the drying or if improperly conducted. However, its legitimate and wise use is to be recommended.

Steam and conditioning treatments are given lumber for three general purposes: First, to heat the stock through at the beginning of the run; second, to kill mold and some wood destroying fungi; third, to remove stresses.

It is beneficial to steam at the beginning of a kiln run, to heat the stock thoroughly before evaporation from the surface begins. The surface of wood ordinarily dries more rapidly than the interior water can transfuse through the wood, with a resultant danger of surface checking and casehardening. Inasmuch as heat stimulates transfusion, it is desirable to have the centre of the wood hot before any drying takes place. If the cold stock were placed in air at less than saturation the temperature of the centre of the piece would always be less than the dry bulb temperature of the surface until evaporation ceased. As heat is made latent through evaporation, the temperature of the air of the kiln is higher than that in the centre of the wood. It has been indicated in several experiments that the temperature on the inside of a piece of wood comes to balance with the dewpoint of the air surrounding the piece.

Whether initial steaming reduces the subsequent drying time or not is uncertain. In the case of 2-in. oak plank cut from the outside 6 in. of 26 different logs, including four species, the initially steamed stock dried more rapidly than matched plank which were not steamed. The drying rate of heavy stock, 4 x 5½ in., cut from the heart of the same 26 trees, was only slightly accelerated by the initial steaming.

Mold thrives on the surface of wood when it is moist and warm. While not in itself injurious to the wood the presence of mold indicates conditions which are conducive to actual decay. Mold often develops to such an extent as to seriously obstruct circulation of air through the pile. This is such a decided hindrance to successful kiln drying that steps must be taken to prevent growth. Inasmuch as mold will not withstand high temperatures, steam is an excellent means of applying to the surface of the stock a degree of heat which will kill the mold. The saturated air prevents surface drying and thus the injurious effects commonly produced by high temperatures are prevented.

Steam and even hot air somewhat less than saturated may be used to remove the fibre stresses set up during drying. If the surface is in tension it is possible to so swell it by increasing the moisture content that it will be in compression it is possible to soften the outer fibres so that they no longer resist the inner tension, thereby permitting more normal shrinkage.

To Re-establish Transfusion

Steaming is sometimes resorted to to re-establish the capillary flow after the surface has been excessively dried. Periodic steaming thus apparently increases the drying rate, but this may be due more to the fact that after steaming the centre of the material has available

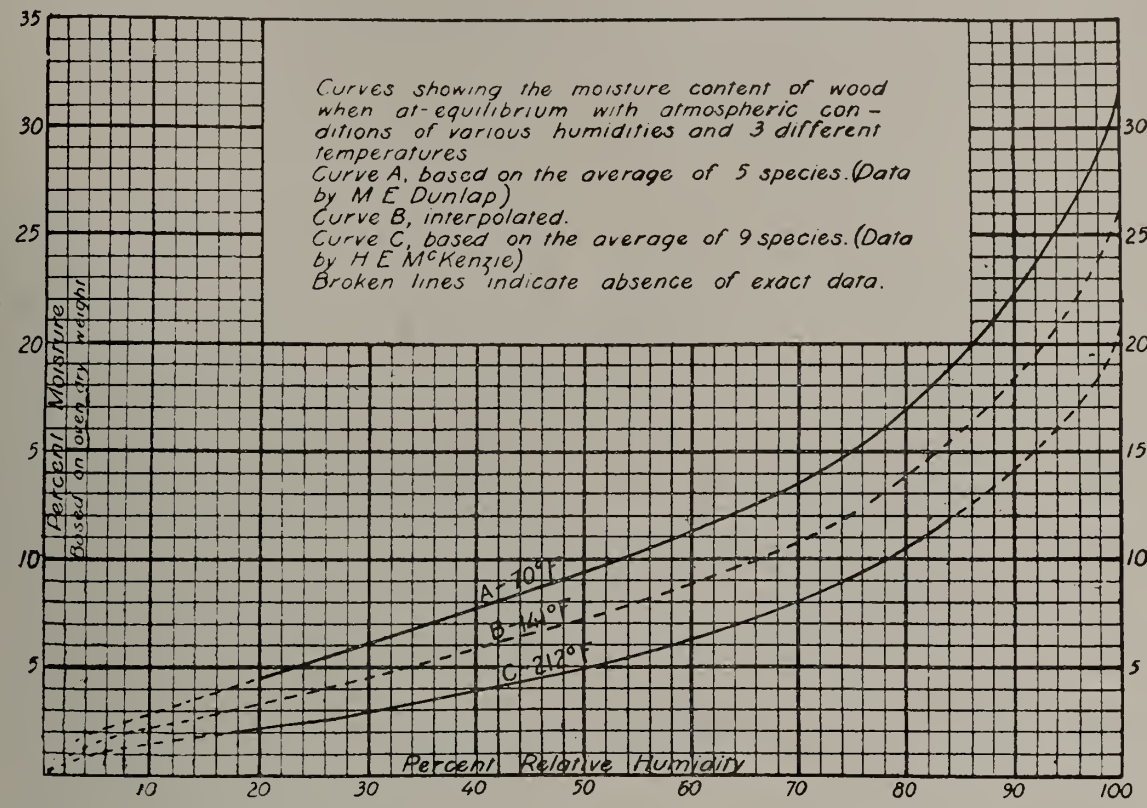


Chart showing moisture content wood will ultimately reach under varying conditions of humidity and temperature.

a large supply of heat which is utilized in vaporizing the internal moisture.

Directions for steaming lumber up to 10/4 in thick, to heat stock through at beginning of run: Green stock should be steamed at 25 degrees Fahrenheit above the initial temperature (100 per cent. humidity) until the stock is heated uniformly throughout, usually requiring about one hour to the inch in thickness. This initial steaming is not detrimental to successful kiln drying of perfectly green stock, providing the cooling is accomplished slowly and in saturated air. In fact, steaming 4x5½-in. green oak for 24 hours at 190 degrees Fahrenheit at the beginning of the run has been accomplished with no visible damage. However, it was cooled to the drying temperature in completely saturated air. This treatment is not recommended because it tends to induce excessive shrinkage, which is troublesome in large material such as bolsters.

Partially air dry stock which is surface checked to any extent should not be over-steamed. The outer fibre should be softened with the minimum amount of swelling inasmuch as if the surface is excessively swelled and put into compression the resultant internal tension will tend to deepen the checks. Inasmuch as heat in this case is the primary softening factor, it is desirable to use high pressure steam so as not to increase the surface moisture materially. Steaming treatment should not be continued after the surface checks close. If lumber of any species is so near dry that its centre contains less than 18 per cent moisture, it should not be steamed at 100 per cent. humidity, but should preferably be conditioned in air at 165 to 180 degrees and whose humidity is less than saturation, 65 to 85 per cent. relative humidity. This conditioning treatment will require from 10 to 30 hours, dedpending on the moisture content of the stock and how badly it is casehardened. When the moisture content is low, and the stresses severe the relative humidity should be 60 to 70 per cent., temperature high and the period long.

To Kill Mold

The most effective manner in which to kill mold in a dry kiln is to steam the stock at approximately 170 degrees or 180 degrees for a period not exceeding an hour. It must be borne in mind that, unless it is desired to relieve stresses also, the interior of the stock should be heated as little as possible. Therefore, the steam supply should be sufficient to reach the desired temperature in 25 or 30 minutes. To accomplish this result, plenty of live steam at a pressure of at least 70 lbs. gauge must be available. The size of supply line and the number and size of perforations that may be required in the steam jet line will vary with local conditions within reason; it is impossible to make them too large or too numerous, as the quicker the steam is supplied the better the effect. Care should be taken to see that the stock cools in nearly saturated air.

Set-casehardening is defined as a condition of stress produced in wood by the difference in the amount of shrinkage produced in two adjacent zones of wood of the same moisture content. The zone which shrinks the least is said to be set in an expanded condition.

Wood becomes soft and plastic when treated in hot, moist air. The degree of plasticity varies almost with the temperature and relative humidity of the air sup-

plied. That is to say, wood becomes more plastic when steamed in saturated steam at high temperatures, 180 to 212 degrees, for example, than when treated in air at 140 degrees Fahrenheit and 70 per cent. relative humidity, or soaked in cold water. In short, it requires the combined effects of heat and moisture to make wood fibres so soft that they can accommodate themselves to the ever-increasing demands to change of shape and of dimension as drying and resultant shrinkage progresses.

The relief of casehardening is a matter which requires both knowledge and experience. No absolute rules can be laid down by which the best results can be obtained under all conditions. The treatment used must be the one which will properly relieve the compression stress wherever it may be. If the moisture distribution test shows that the compression zone is near the surface, i.e., that only a thin shell has tried to shrink, it will not take a long steaming treatment to soften the fibres. If the compression zone as determined from a slotted case-hardening section extends quite a distance into the piece and the moisture content of the zone is low, it is obvious that a short conditioning treatment will not relieve the set because the moisture required to soften the fibres cannot be supplied in a short time, as has been shown previously. When the stock has been heated to the centre, moisture from adjoining cells will diffuse into the cells of lower vapor pressures, but some time will be required before this transfusion can be established.

Duration of Softening Treatment

The duration of the treatment will depend on the depth of the casehardened zone. The temperature should be governed by the degree of softening the fibres require.

Temperatures from 160 to 180 degrees and periods from½ to 3 hours, if steam is used, and from 6 to 30 hours if the air is not saturated.

As already pointed out, the fundamental principle which underlies the problem of relieving stress in wood is that it requires an actual contact between hot vapor and the wood substance which is to be softened. If the vapor is not in the cell when it is heated, it must be supplied by the external vapor or by the vapor of the interior cells, which contain more moisture. It should be borne in mind that saturated water vapor can not give up its heat except by condensation. If heat is being transmitted to lumber largely by saturated water vapor, it is evident that the surface of the lumber will have a larger amount of moisture deposited upon it than if air transmitted most of the heat to the lumber. It must also be borne in mind that the more moisture there is in wood, up to the fibre saturation point, the more plastic the wood becomes when heated to a certain temperature.

These two facts make it clear that it is possible to relieve the "set" in the surface of a board in any humidity above that required to stop evaporation and that the softening effect can be controlled by controlling the amount of moisture in the air which can be picked up by the board.

Things Which Should be Avoided

There is no danger of softening the surface of the board too much as long as there is plenty of moisture in the board itself, which, when heated, will soften the internal wood fibres. In that case the set of the inside and outside are alike relieved and any difference in shrinkage is due to a difference in moisture content only. If, on the other hand, there is not sufficient moisture in the centre to soften the internal fibres while the surface is saturated, the surface set will be relieved while the set in the internal zones still remains. This is called reverse casehardening, and is a very unfortunate condition, because it can never be corrected save by moistening the material clear through and subsequently redrying it carefully.

In general it is safe to steam (100 per cent. relative humidity for from ½ to 3 hours) when the centre of the material does not contain less than 18 per cent. moisture. When the centre is drier than that the humidity should be so regulated that the surface can not become too moist and thereby softened more than the interior. In giving a high humidity treatment when the centre of the stock is from 15 to 18 per cent. the relative humidity should be between 70 and 85 per cent., below 15 per cent. and not less than 7, the relative humidity should be 60 to 70 per cent. The duration of the treatment will range from 10 to 30 hours. See Plate 1 as a guide for proper relative humidities to use in conditioning lumber at any desired temperature. As heat is also a big factor in any conditioning treatment, it is desirable to use a temperature ranging from 160 to 185 degrees, irrespective of species.

It should be borne in mind that steam at low pressures contains less heat per unit of weight than at high pressures. So if it is desired to heat the kiln of lumber to a certain degree with low pressure steam the moisture content of the stock will be increased by a greater amount than if the same rise in temperature is produced by high pressure.

Periodic Steaming Treatment

Steaming periodically once a week even when the stock is above the fibre saturation point is beneficial. These steaming treatments should be at about 20 to 30 degrees higher than the drying schedule and should continue only long enough to heat the stock through at that temperature. If high pressure steam is used the time will vary from one-half an hour to three hours. This method of treating the stock produces the minimum amount of set and tends to decrease the drying time.

When steaming, the air should be saturated while the temperature is being raised and the humidity should remain high while the kiln and charge is being cooled down. It is desirable to build up the temperature as quickly as possible, since a slow heating process means a loss of time and also tends to wet the surface of the stock too much. Vents should not be opened if by so doing the humidity regulation is lost. In a conditioning treatment everything depends on the humidity control, so use heating coils only as means of maintaining humidity desired.

Frequently it is hard to establish circulation after steaming, since the saturated air will remain stagnant unless something is done to break up its state of equilibrium. Any motion of air through this zone will break up the stagnation. Different means of doing this must be worked out for almost every installation of kilns.—Sash-Door-Finish.

Woodworking machines at an exhibition always have a fascination for the average man. The trouble is, that the machine can not show its paces at an exhibition.

Move to Standardize Wooden Boxes

Bureau of Explosives, Under Col. W. B. Dunn, Has Been Asked to Undertake Study of This problem—Outline of Procedure to be Followed.

By Col. W. B. DUNN, Address Before National Association of Box Manufacturers.

You probably know that almost from the beginning of its work some fourteen years ago the Bureau of Explosives has been charged with the duty of specifying shipping containers for explosives and other dangerous articles. The object of the work of the Bureau of Explosives was to secure safe transportation of these dangerous articles and it was appreciated very early in the work that the prime factor in getting that safe transportation was to get efficient, good shipping containers.

It is more true of a dangerous article than any other article, but I think it is true of any article, that if you are going to get safe satisfactory transportation you must avoid leakage. You can't afford to have your article get out of its container, get free and lost in the car or on the freight platform. When an explosive or inflammable liquid gets out you are liable to have an explosion, with fire following it; with ordinary articles you have a loss. In either case you have a loss and loss is what we are trying to curtail.

To Cover All Classes of Freight

It is a fact, I think, that the country generally has appreciated the value of the standardization of these containers for dangerous articles. Probably as a result of that general appreciation, the railroad executives some time ago decided that they wanted the Bureau of Explosives to expand that work and to start, at least, the very important and far-reaching task of standardizing shipping containers for all classes of freight.

It was an exceedingly important and difficult task that was put up to me by that decision. It is true that no one expects a revolution of present practices in any short period of time. The idea of the railroad executives was to start this thing and to let its program depend upon development. My plans, so far as I have perfected them, are as follows:

In a very conservative way I am going to build up a personnel to handle this proposition. During the present year, in fact up to the present time I have picked out four young men, engineers who have the requisite education as a foundation, and I hope the energy necessary to apply that education in the line in which I want them to work. They are being trained at the present time, first in the regular Bureau of Works so as to understand our methods and to be available to do Bureau Work if required.

Will Make Detailed Study

When that training is completed some one industry will be selected and one or more of these men will be assigned to the task of studying and investigating the shipping containers to be used in that industry. They will go back to the manufacturing centers where the product itself is started in largest volume. They will go to the manufacturing centers where the containers are made in largest quantity. They will find out, list and describe in detail all of the different kinds of containers that they find being used in that industry. They will collect from all sources all of the specifications that they find being used in the manufacture of the container, any rules that may be in the railroad tariffs or in the classifications, any specifications that may be used either in a limited way or a general way by the large shippers or by the container manufacturers.

They will study from an engineering standpoint as well as they can the details of design and construction of these various containers that are being used in that industry. As far as the engineer himself is able from his experience, he will point out where improvements can be made without any increase of cost. It is the making of improvements without any increase of cost that we hope to register the greatest amount of progress.

Will Select Best Practice

Now, when he has looked over the field in that way I fancy that he will find that when you classify the containers in actual use in that industry, they may run through more classifications than good, bad or indifferent. There may be a dozen or more classifications, when you run down the grade of efficiency. If we were looking solely to the interests of the railroad, we might possibly tell this engineer to design a package which will surely carry the product through without leakage under any kind of rough handling. It is not my intention to do anything of that kind. My instructions will be to look for the best package that is in general voluntary use as a tentative thing to pick out for a standard.

Where you find such a package in general use, much better than many of the packages in use in the same industry, I think it quite fair to assume that that better package is there because some far-seeing man or group of men, either in the shipping line or the container line, realized that money put into that package was well spent. If we find that that is true, then it is not asking too much of other people to gradually work up to that standard.

When this engineer, after his investigating has presented to me this mass of information in regard to that industry, and has presented to me a tentative set of specifications for the various satisfactory containers that he has found in use in that industry, I want then to have at my elbow in the studying over of this important matter, what you might call a technical jury. I want a body of men to whom I can refer this mass of information, these recommendations of this engineer and ask them to look it all over and from the standpoint of their broad experience, tell me what they think about it.

Each Association to Have Representative

I want that jury composed of the very best men that the associations who are asked to contribute representatives can pick out. There will be at least one representative, according to my present plan, from each association of men who are engaged in the manufacture of shipping containers. For example, the association here to-day, interested primarily in the manufacture of wooden boxes, should in my opinion pick out the best engineer that they have, the

man of broad technical engineering experience, because only engineering questions are coming before this jury. There are lots of other questions that come up but they must come later. The first step is the engineering study of the question.

In the same way that the box manufacturers association, the wooden box is represented, all other associations of men who make any other kind of container, any other kind of a box, fiber box, wirebound and the barrels, as we come to them later on, wood, metal if there were in use any metal boxes we'd get the metal box men.

After we get this committee organized and we get the data as I have described up to it, I really believe that we can get from your committee and from my report which will be based upon your help and recommendations, something that can go to the railroads and the shipping interests of the country as a real, practical, efficient standard for the particular kind of a shipping container that is being considered at that time.

All Interested To Co-operate

If we take, for example, the boot and shoe industry, just an example of hundreds of other industries that must be taken up before this board, if I assign a man, as I have already assigned a man to that particular study, when he gets his report on the containers for boots and shoes and the thing is ready to go before this jury of experts from the shipping container organizations, I of course will ask the boot and shoe industry to appoint a technical man and the best man they can find, to become a member of that committee while the boot and shoe question is under consideration. Possibly other than technical men from the boot and shoe industry might be useful at the time that that report is under consideration.

A man who doesn't know all about the design and manufacture of boxes but does know the trade end of the situation and the requirements that these packages must meet to be successful in the trade, what he says would be of use in considering this particular question, but these representatives of the boot and shoe industry would be members of this jury only while that boot and shoe proposition was up. When some other question, dry goods for example, was up before the jury, why there'd be some man from the dry goods industry that would be a temporary member of this committee I am trying to organize while your representative would be a permanent member.

Peculiar Situation Exists

This suggestion to you to standardize wooden boxes is not, fortunately for the Bureau of Explosives and the railroads and everybody interested in the subject, a new thing. You have already appreciated the importance of that. You have already taken the pioneer action necessary to develop information on it, so we are simply asking you to do something that you have already decided to do. I know that and os I feel that my request to you to appoint a member on this committee will be a welcome one.

It is astonishing to me that all shipping containers for years in this country have been made apparently without anything more than a desire to meet local conditions and local problems. It is almost to my mind the same as if our engineers throughout the country had built bridges without having any real design for bridges and without any method of computing stresses and strains and without any mathematical knowledge beforehand that the bridge was going to be satisfactory. If that had been our plan, you see what kind of bridges we'd have all over the country.

This is an engineering age. Anything that is mechanical in design or construction must pass through the engineer's hands before it gets anywhere else, and you in the country at large, it seems to me, have been negligent in not developing your engineers and putting them on the job before you settled down to say what you were going to do. I think in a general way that explains just what I have in view in the organization of this committee.

Box Men in Convention

The convention of the National Association of Box Manufacturers, staged at Atlantic City October 5th, 6th and 7th, was one of the most enthusiastic and best-attended gatherings of this kind ever held by the box men. More matters of importance to the industry were handled at this gathering than at any preceding meeting, and the future work of the association as outlined is such that when carried to a successful conclusion it will reflect directly to the industry and will put it on a higher basis than it has ever been before.

One of the most important matters handled had to do with the appointment of a representative to work with the Bureau of Explosives of New York City on specification work. The Bureau of Explosives, which represents Canada as well as the United States, have determined to make a study of box specifications with the idea of curtailing as far as possible loss and damage claims.

In the past there has been a feeling that the scientific information gathered from box tests by the Forest Products Laboratory was merely interesting and was more of an academic nature than practical in its application, and further that the information would not be used in an endeavor to compel manufacturers to produce a better container. This new move on the part of the Bureau of Explosives, which is being undertaken in conjunction with the various railroad systems, means that the information gathered by the Forest Products Laboratory will be used by this Bureau as a basis on which to build specifications.

Thus it is likely that it will be necessary for the box industry to study their product, especially in view of the information brought out by the scientific tests carried on by the laboratory, and make what changes in their line are required to meet practical manufacturing conditions.

Nailing Suggestions

"Use only cement coated box nails.

"Drive nails flush. Do not over-drive.

"Start one inch from edge, space nails holding to end grain about one and one-half inches apart.

"Space nails holding to side grain not over two inches apart.

"Use 6 penny cemented box nails for framing and top and bottom.

"Tops and bottoms should be side nailed.

"Use 4 penny cement coated box nails for side nailing.

"Five nails in side nailing edges increases strength of case 50 per cent. over same case nailed with four nails.

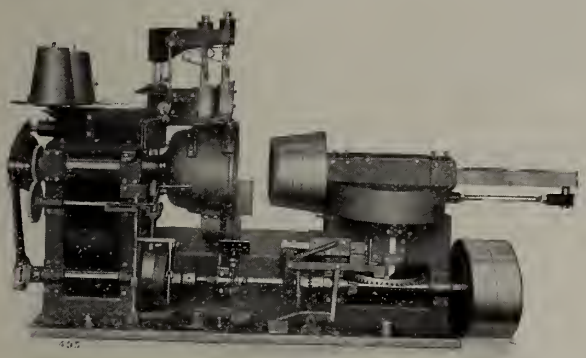
"Side nailing should be done at cannery."

Safety first means always put the belt on the loose pulley before you leave the machine.

Machinery & Equipment

Bushel Basket Machine

A machine for making bushel baskets, known as the "Merit Bushel Basket Machine", is shown in the accompanying illustration. This is manufactured by the Merritt Engineering & Sales Co., Lockport, N. Y. The making of bushel baskets is a production job, and to be able to compete successfully, one must be able to turn them out rapidly and at a very low fixed

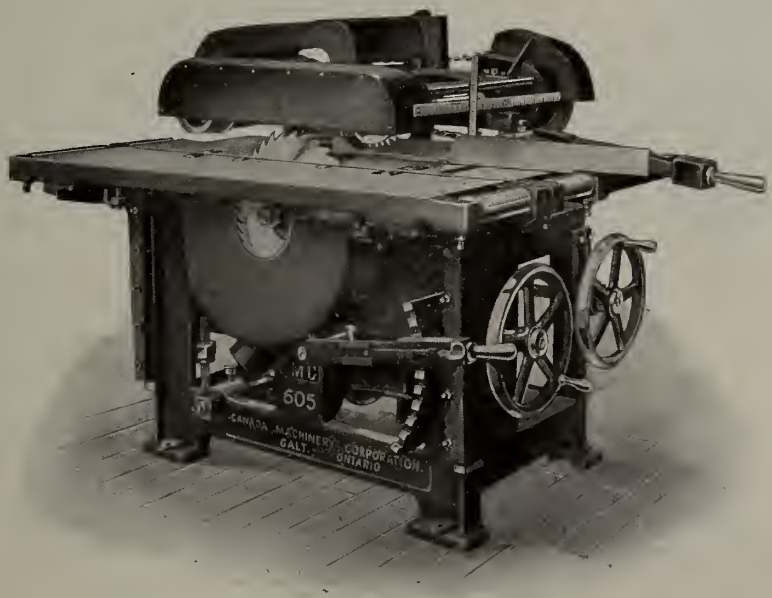


The "Merit" bushel basket machine

cost. This machine requires but one operator. Two inside hoops, previously formed, are slipped into place on the male form. The two outside bands are entered in the guides in front of the stapling device. The braid is placed in a vertical position between the two forms, its lower edge resting upon the adjustable centering device. When one lever is pressed, the male form moves forward, forcing the braid into the hollow form, making the basket, and when the second lever is pressed, the two forms with basket between them, begin to revolve, and at the same time the staples are formed and driven. When the last staple is driven, the movement stops. The revolution of the forms and stapling maximum can be stopped instantly at any part of its way round. A machine of this type is capable of producing 175 dozen baskets in a ten-hour day when operated by one man.

New Self-feed Saw

A number of new saws are being placed on the market by the Canada Machinery Corporation of Galt, Ont. One of these machines was described in the October "Canadian Woodworker." A second, the No. 605, is illustrated and described herewith. In telling us about this saw, the makers say that after thirty years' experience in the building of self-feed rip saws, they deemed it advisable to include their new improved patented features in a saw of this type. Many parts of the older types have been eliminated, the result being a simple machine of improved design which is capable of producing a very satisfactory grade of work. In this new saw, the table is made in two parts. The inside edges of these two sections are fitted with wooden strips. The outer part of the table may be opened to give ready access to the saw and also to permit use of gang saws or dado heads. The saw arbor is of large diameter and is supported in three long rigid bearings. A specially designed self-oiling end thrust has been provided for taking up end-play. The collars, which grasp the saw, are of large diameter, holding the saw stiff and firm. The feed

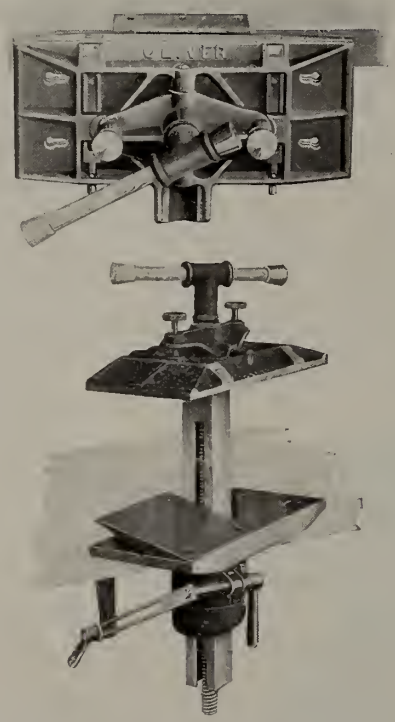


Self-feed rip saw recently placed on market by Canada Machinery Corporation, Limited, Galt, Ont.

is variable from 1 to 225 feet a minute, and is under the instant control of the operator. The feed-roll yokes are of an entirely new system. Both the infeed and outfeed yokes have the pressure applied for feeding purposes directly in line with the cut. The feed rolls in rising to the work, lift in a vertical line the driving shaft or roll, remaining parallel to the table. This assures a straight line feed. Two index scales are attached, one showing the width at which the fence is set, and the other the thickness for which the machine is set to cut. The feed rolls are subject to adjustment and may be set for either short or long stock, as desired. Large hand wheels are provided for adjusting the feed rolls, also for raising and lowering the table. Short idle rolls are fitted in the bed to facilitate the movement of stock across the table.

Efficient Type of Vise

A vise known as the "No. 1 Universal Pattern Makers' and Woodworkers' Vise" has been put on the market recently by the Oliver Machinery Co., Grand Rapids, Mich. This is a new product and embodies several new features. As the name "Universal", implies, it can be used for holding stock of various shapes



Two views of Oliver Universal Vise

and can be tilted to practically any position. The jaws are 7¼ inches wide by 18 inches long and will open to 16 inches. The screw is made of steel 1⅛ inches in diameter and having buttress thread. The clamp lever, shown with two thumb screws, is used to set the jaws to hold wedge-shaped work. It will be noticed that it is equipped with a number of dogs which make it very handy for cabinet-making and pattern work, where many pieces of irregular shape are handled in the course of a day. By turning the vise upside down, two jaws for holding metal pieces are brought into play. This is a very handy feature. Another feature which might be mentioned is the tilting jaw attachment. This is shown in one of the accompanying illustrations. Taking it all round, it is difficult to conceive of a piece of wood of such irregular shape that it cannot be held in some manner by a vise of this type.

South African Market for Wood Products

The report of W. J. Egan, Canadian Trade Commissioner to South Africa, covering the imports of wood and wood products into the Union for 1920, states that Canadian manufacturers handling these lines have in the past merely touched the South African market, the bulk of the trade going to Scandinavian and American houses.

Of the 2,175,000 cubic feet of flooring and ceiling imported last year, Sweden supplies 1,750,000 cubic feet; Norway, 252,000 cubic feet; Finland, 120,000 cubic feet, andd Canada, 22,000 cubic feet. In dressed woods and matched flooring Canada heads the list of shippers, with 58,000 cubic feet, while U. S. manufacturers come next with 54,000 cubic feet. Plywood to the value of $139,000 was imported during 1920, and of this Canadian produeers supplied only a few dollars' worth. The same holds true of windows and doors, the bulk of the business going to Swedish and American houses. The imports of wood handles totalled $285,000, of which Canadian manufacturers supplied $21,000.

This market offers a good opportunity for box manufacturers. The value of the shooks imported during the past year was $1,001,675. As with the other lines, Sweden secured the bulk of this business. Mr. Egan states that if Canadian box manufacturers were organized along the lines of the Baltic exporting firms, there is no reason why Canada should not secure a greater share of the box and shook trade. In the standard orange box alone, it is confidently asserted that the annual requirements will not be less than a million boxes, and, in addition, there are many other standard containers used in the country, which means a demand for many additional hundreds of thousands of boxes.

The freight rates are one of the crucial factors in this trade. No matter how up-to-date the Canadian plants may be and regardless of how plentiful a supply of raw material they may have, unless the ocean freight rates are lowered so as to compete with the Baltic rates, the Canadian manufacturer canont secure and hold this market.

It is advisable to have several traps in the floor connected to the dust-removing system. All that is needed, then, to have a clean mill is the inclination and a broom and a boy to use it.

The woodworker with a drying plant is independent of the weather. He can dry his timber so that it is easy to work, and safe, after it is manufactured.

Theer are a good many devices for setting circular saws, but to get exact and clean sawing a gauge and saw set should be used.

It is advisable not to over-drive nails in a box. Nails which are over-driven crush the fibres of the wood from 1/16 in. to ⅛ in. deep, thus lessening the hold of the nail.

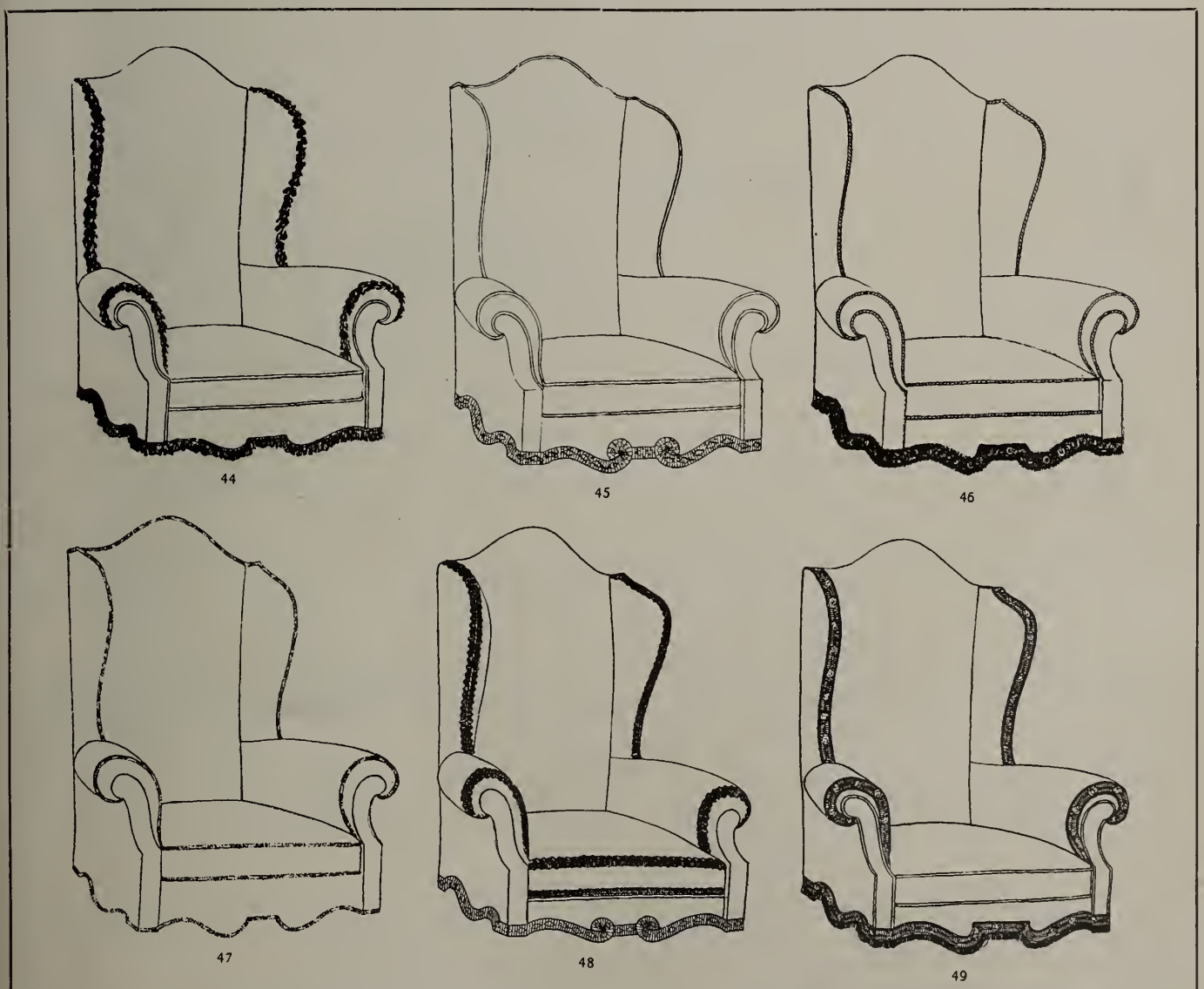
Upholstering and Trimming

Modern Upholstering

Various Ways of Trimming Chair—How Welts Are Made—Employing Glue to Attach Trimmings.

There are various ways of trimming the chair illustrated in Fig. 41, and in some cases the character of the intended trimming not only determines the final appearance of the chair, but has much to do in indicating the preliminary upholstering. This occurs particularly with regard to the finish of the edges. If the wings and back are finished to a knife edge and intended to be trimmed with a stubby fringe, as indicated in Fig. 44, the knife-edged upholstering must be determined upon before the chair is started. In like manner, if the chair is to be finished with double welts, like Fig. 45, the edges and nosings, which form the foundation of the upholstering, must be kept square at the top of the back and on the edges of the wings to create a proper foundation for the welting.

Fig. 46 shows a cording treatment where a separate silk cord replaces the welt. Fig. 47 shows a moss edge as another variation in the trimming. Fig. 48 shows the same chair treated with a wide galloon on the outlines of the chair, while a double French gimp, with a cord center, is used on the cushion. Fig. 49 illustrates a fancy band trimming in combination with a cut fringe.



How Attractive Effects May be Secured by Varying the Trimming.

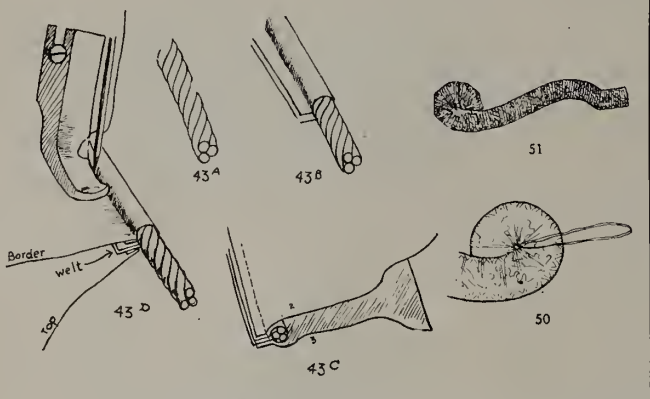
Carvings Should not be Concealed

Loop edge fringes and tassel fringes on the base of a chair such as this are objectionable if they conceal the carving of the upper leg. A stubby fringe, meaning by this term a fringe, the tassels of which literally stick out straight from the heading, may be used with good effect, particularly if it is attached a little above the bottom edge of the frame, so that the carving of the woodwork is not hidden.

Where the welts are made of the goods, it is possible to sew the welt into the covering of the cushion at the same time the cushion is made, thereby saving time and material. The welt is formed by a soft cord, similar to Fig. 43a. A strip of covering, long enough to reach the distance around the cushion and wide enough to cover the welt, is cut like Fig. 43b, and the border of the cushion, the top of the cushion and the covered welt are sewn together by a single stitch from the wrong side, as in Fig. 43c. The cushion cover is then turned right side out, and with a sewing machine, equipped with a special welting foot, a second stitch is run around the cushion just inside of the welt in the manner in Fig. 43d.

Contrast in Colors Attractive

A variation in welting is sometimes created by making the welt of a contrasting plain color; This



Showing How Welts Are Made

method, however, is not recommended because in unskilful hands, it is apt to produce a garish effect. We mention the custom, however, to have our description complete.

In the better shops, where a double French gimp is used as a trimming for the cushion, as indicated in Fig. 48, it is a practice to welt the edges of the covering in the manner we have here described in connection with Fig. 45. The double French gimp has a cord which creates an edge, and the welt is used to make the cord of the gimp fill out instead of sinking into the cushion.

In using a flat galloon, as in Fig. 48, whether it is as wide as indicated in Fig. 49, which covers the face of the wings, or is merely a one-inch galloon as is indicated on the base of the chair in Fig.48, the character, of the appearance will be very largely determined by the way in which the galloon is put on. Neatness is a prime requisite and an important element of neatness consists in the way the pleats are formed in the method of attaching the galloon to the chair.

Must Maintain Lines of Chair

The point we are endeavoring to emphasize is best we show a section of the base of this chair with a one-inch tinsel galloon tacked into position, the fullness of the curves being disposed of by pleating. As an alternative, Fig. 50 shows a combination of glueing and sewing. The lower edge of the galloon is glued all along the base of the chair, being held with tacks until the glue hardens. This method leaves the upper edge of the galloon unattached. In all galloons there are fairly stout warp threads which form the selvage. With a pin, it is possible to draw two or three of these warp threads through the edge of the selvage and utilize them as a shirring string to dispose of the fullness in the manner indicated in Fig. 50. This not only disposes of the fullness equally, but it also creates smooth curves which are finally sewn to the covering with a small circular needle and thread, which matches the covering, thus creating the appearance shown in Fig. 45.

Glue is employed frequently for attaching the trimming to the hard base of the chair, but on the edges of the arms, the wings and the back, it is always better to sew the trimming in position, whether it consists of fringe, cord, moss gimp or welted paneling, and it is a practice in good shops, wherever there is a flat trimming of any kind, to have the same pinned into position complete before sewing, as only in this way is it possible to maintain a uniform appearance between the right and left sides of the chair.

Cording, such as is shown in Fig. 46, is usually sewn on free hand, but care should be taken to chalk the line of sewing so that an accurate and symmetrical outline will be presented in the finished article.

Increasing Supply of Upholsterers

The National Association of Upholstered Manufacturers recently held their semi-annual convention at West Baden, Ind. A number of interesting and pertinent topics were discussed. One question of great importance, which came up for discussion, had to do with the training of apprentices. It was proposed that the members of the Association inaugurate a system whereby they undertake to train one apprentice for each journeyman upholsterer in their plants. Another proposal was that the executive secretary use every effort in his power to influence the members to make their prices accord with their costs, leaving a reasonable profit, rather than to follow the market in a purely competitive way regardless of cost. Both these subjects are of vital interest to all furniture manufacturers and should receive their thoughtful consideration.

Practical Carpentry and Practical Joinery

Two practical well-illustrated volumes on "Modern Carpentry" and "Modern Joinery," have been received recently from the publishers, Messrs. B. T. Batsford, Limited, 94 High Holborn, London, England. The author, Mr. George Ellis, is a well-known craftsman of long and varied experience who has a number of volumes to his credit.

"Modern Practical Carpentry" is a large volume containing 500 pages with about 1100 illustrations and deals in detail with the methods of constructing and erecting roofs, floors, partitions, scaffolding, shoring, gantries, centering, stands and stages, coffer-dams, foundations, bridges, gates, tunnels, half-timber house and other structural details. It also contains new and simple methods for finding the bevels in roofs, setting out domes, steeples, etc., an account of fail-

ures in construction and a chapter on the uses of the steel square. The illustrations, many of which are single and double-page plates, show in detail the various phases of the subjects treated.

"Modern Practical Joinery" is a larger book containing about 600 pages, together with 1400 illustrations. It deals with the finer phases of construction work both by hand and by machine. Some of the subjects covered are drawing instruments and their use, tools, appliances and apparatus, joints and fasteners, machine shop practice, uses of steel square, house joinery, bank, office, church, museum, domestic and job fixtures and fittings, showcases, airtight cases, splayed and shaped work, new materials and methods, stair buiding, doors and panelling, windows, fittings and finishes, compound curve and shape work and miscellaneous fittings and fitments. A chapter on "Foremen's Work" deals with the reading of plans, the meaning of terms, setting out rods, methods of setting out curves, uses of templets and other subjects of vital interest to foremen.

These volumes are not elementary and were not prepared for beginners or apprentices but were written by a practical man for the use of cabinet-makers, carpenters, contractors, architects and woodworkers.

Acquiring Specialized Knowledge

The difference between the man who succeeds and the man who nearly succeeds or fails is largely a matter of attention to detail. Attention to the little thing and the habit of being critical and even hypercritical in work done spells the difference between success and failure in the majority of cases.

There are men who move along in a groove or rut, who do things in the manner that they were taught, perhaps a generation ago, who dismiss all thoughts of work from their mind when the whistle blows and sometimes a half hour or so before the whistle blows. If their work gets past the inspector without any kicks they are satisfied. Such men are oftentimes the gamblers and critics who cannot see why their pay is not increased with their length of service. They understand their craft but superficially. Let an occasion come up when just a little more technical skill than a rush 'em through job requires and they are colloquially speaking "up against it."

The furniture business to-day calls for technical knowledge—more of it every day. The man who designs must know something more than merely to sketch a chair leg, or to make a scroll, or handle a simple blue print. He should have the history of design at his finger ends, so to speak, and to be able to know Renaissance from Chippendale, or Queen Anne from Louis XV. He ought to know something—a great deal—about color schemes and architecture and the niceties of interior decoration. In the future he must know these things. He also must be a construction engineer.

The finisher who does not know the chemical action of the pigments he uses and how they will act under certain circumstances, who goes on the guess work principle is going to be a heavy liability to his firm some day. It is the same in almost any branch of the furniture industry. The composition of glues, the quality of woods, the nature of fabrics, the handling of leather all call for technical knowledge. And there are a score of sources available for the man who really wants to know how. Then why not learn?

The long winter evenings are again with us. Suppose you read only two or three books this winter, each one telling you something about your line of work. Cabinetmaking, Designing, Upholstering, Finishing, Woodcarving. Get a book and read it through not only once, but twice or three times. Make up a list of questions yourself from the reading matter and then ask yourself these questions and see how much you remember of what you have read. Don't think that you are doing this for your employer; you are doing it for yourself. You need this knowledge, besides all that you can acquire from actually doing the work. Start this week and see how much you can absorb by spring. Some day, maybe soon, you'll find it mighty handy knowledge.

One manufacturer in Memphis, in commenting on the present situation, says that it has been apparent for some time that any decided revival of buying would accentuate the absence of normal production of southern hardwoods, and it is equally apparent from the anxiety that buyers are displaying that they are afraid there is going to be an extreme shortage of supplies before production can get under way. There has been some increase in production stimulated by the greater strength and activity of the market, but it will take a long time for the output to be brought back to anything like average for this time of the year. This is the season during which a supply of logs for next year's cut is gathered, and, while weather conditions in the lumbering areas have been almost idle during the past month, judging from reports received very little has been accomplished from the viewpoint of trees felled.

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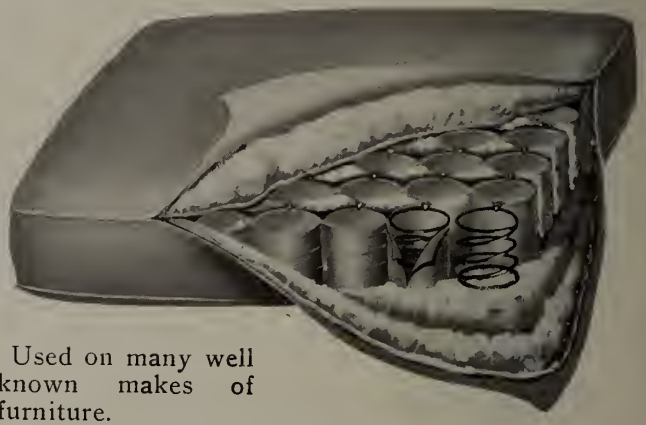

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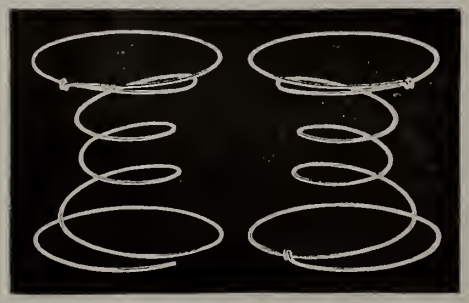

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Development of Hardwood Finishes

As Finishes are Cheapened through wide Application to Low Priced Products New Finishes Must be Worked out for the More Exclusive Lines

by A. A. K.

The old method of filling woods consisted in applying coat after coat of varnish and rubbing each coat, as it dried, into the wood until there was secured a hard, solid surface. Some other writer says that the old-time finisher scraped down each coat, "until, after a long space of time, the surface was level." That probably was so, but we did it by means of a soft-wood, chisel-shaped paddle, pushing the nearly-dry varnish into the open pores of the wood, and when they were filled it only remained to apply the necessary number of coats of varnish, flowing and finishing to finish the job.

This same writer, whose name I do not have, tells us that the very ancient wood-finishers did not undertake to treat hard, open-pore woods, as we do, but confined themselves to the soft, close-grained goods. At least this was true in a great many instances. And even at that they did much finishing with paint and varnish. We know that many of the pieces made by Sheraton had painted panels, beautiful medallions with Greek subjects. And also, while at this point, let us note that at about the time that the more open-grained woods began to be used, the furniture, which up until then consisted of thin, spindling designs, began to be made heavier and more massive in general design.

Continual Change in Finishes

Wood-finishing has gone through, and continues to go through, a period of evolution. New finishes arise and decay, to be superseded by improvements, and if not always by that, then surely by changes, in the process of evolution. Mission at first related to a design, then it became the name of a finish, as well as a design or style. This style of finish has had great influence in determining shades of finish in all directions of furniture and architectural work. It has proved one of the most popular finishes ever offered to the public. Will it ever become obsolete? Undoubtedly, and be replaced by another candidate for popular approval.

I wish it were possible to write a connected historical sketch on the art of wood-finishing. It would be interesting to know who originated wood-finishing as we know it. That date cannot be very remote. We know that for some centuries wax finishing was in vogue, but as far as the filling and staining of wood is concerned, we do not seem able to find any reliable data.

I have read that a resident of Mayence, Germany, was one of the earliest to devise processes for the staining of wood and that he confined himself almost entirely to alcohol stains because at that time to stain a piece of wood required a week or more, also that the water stains opened the pores of the wood so much that it was almost impossible to properly finish it. For this reason he confined his staining entirely to alcohol stains, nor had he the facilities for staining that we now enjoy. To illustrate this fact we may mention that in order to get a bright yellow stain he had to apply a solution of chloride, after which the stain itself was placed in an air-tight room where it was subjected to the fumes of sulphite of hydrogen. In another case where a certain shade of stain was desired, he was obliged to boil the wood an entire day in one bath and another day in a different bath before the process was complete. If only he had known about the strong acids that we use to-day, just think how it would have helped him.

Advent of Wood Dyes

But I believe that the wood dyes were known about this time, though no great progress was made until the development of the coal-tar dyes. Since their advent wood-staining has become a most important part of the wood-finishing trade. Then along about 1890 oak came into favorable notice in competition with walnut and mahogany, and in time even excelled these woods in the popular regard. At first it was simply plain oak, filled and finished natural, and before long the sixteenth century finish came into fashion, and plain oak became dark-colored. This style did not last very long, and it was replaced by the antique finish, the filler being colored.

A few years later golden oak came into vogue. White oak, obtained mainly from Indiana and Ohio, was used in the production of the so-called golden oak finish. Golden oak, with its beautiful golden flakes, produced by quarter-sawing, must be given the palm for being the most attractive wood finish ever designed, yet as I write this golden oak and its rare flakes and markings is no longer admired; people become tired of the most beautiful human creations in art after a time.

Now we come to weathered oak, a finish designed to simulate the effect of weather and time on the untreated wood. Thus we get the rare soft grays, greens and browns, attractive and universally popular. Such finish could only be done with water stains, and the process involved much time and labor to effect a good piece of work.

Used on Cheap Lines

Hence it came that the manufacturer of less costly furniture was obliged to find a cheaper mode of finishing. When the weathered finish was used only on the best furniture of the mission style all went well, but when, as afterwards transpired, this finish, the weatherd-oak mission, was applied to all sorts and conditions of goods, the buyers of high-class furniture demanded a more exclusive finish, and it was found in mission finish. Now, the early English finish shows a solid effect, the pores being filled, while the surface is left smooth and level. This showed up the

natural beauties of the oak, the fine high lights, as seen in golden oak finish, though very much less conspicuous.

Following the old English finish, and for the same cause as placed the weathered finish somewhat in the background, came the fumed oak effect. Not by any means has old English oak finish been discarded, for it still has many admirers. But more people will admire the fumed oak than the old English. It is one of the most popular of all finishes. But the cabinet and furniture trade were not long in discovering that it was rather difficult to get a good fumed effect. It was obtained by exposing the wood to the fumes of liquid ammonia, after which the wood was coated with shellac, which in turn was rubbed to a dull finish. Some pieces received the fumes all right, but it was found that there was frequently a lack of uniformity, the result of which was that the finish was abandoned to a great extent for some time. But, as it is well known, fumed oak finish did not die, and is still a favorite; finishers sought a better method of fuming the oak, and, of course, found it. Now it is possible to get a very fair degree of uniformity on oak of various kinds.

Great advances have been made in recent years in the art of staining and finishing woods. Silver gray used to be effected by boiling the veneers in a solution of iron sulphite. That has been discarded, and we can get the same effect with an acid stain and brush. While this finish is usually given to maple exclusively, a different handling of it makes it effective on certain other woods.

Origin of Terms or Names

The question no doubt has often been asked, whence the names of the various stains used in wood-finishing? It is generally understood that such names as old oak, old English, etc., originated with the appearance of that wood as seen in the old English cathedrals or castles, etc. What with the finger of time and the deposition of soot and dirt, the old, unfinished oak took on a certain dark appearance that people of our time regard with much favor, and sought to copy that appearance on modern furniture and building construction. But there is another source of supply for the well-known stain names, such as Flemish, Baronial, Sheraton, Chippendale, and so on. These names all indicate a style or design, not a finish, but at the same time convey to the mind certain color effects that go with those designs.

A word concerning mahogany finishing. Water or acid stains have long been very satisfactory, and on all woods; but the drawback with them is the raising of the grain, and this is especially bad in the case of mahogany. An oil stain will not answer the purpose, for it is more of a paint than a stain---very serviceable on exterior work, but not satisfactory on inside staining. Here the soluble-in-oil coal-tar stains come in. With these one may make every imaginable color, and by blending, still more colors. They are made to match the water stains, or acid stains, from which however, they differ in not having the mordant qualities of the acid. They are therefore more transparent and brilliant."—"Veneers" Indianapolis.

If trees were grown square, while they would be more convenient for sawing, they would be less for moving from place to place.

Preventing Troubles of Winter Weather

Winter brings the problem of keeping the finishing room at an even temperature and the importance of so doing has often been brought home to many factories by trouble and loss.

The storage room in which the finished furniture is put must also be kept at an even temperature. If the temperature falls much below normal in the storage room, pieces on which polishing varnish has been applied may crack or check.

If it is at all possible every part of the finishing room and the storage room should be kept at the same temperature. This means that the piece to be finished, the stain, shellac, filler and varnish, the finishing and storage rooms, should all be maintained at a temperature of about 65 degrees. The closer this average is maintained, the less chance there is for trouble to develope. If this even temperature is maintained, there will be no temptation to open the windows to "cool off," if the rooms should become too warm. We are all familiar with the effect of a damp draft of cold air from an open window blowing across any piece in the process of finishing.

If a varnish which has been chilled by being kept in a cold room is applied to the work, cloudy effects are almost sure to result. The cold congeals the oil of the varnish, and makes it very difficult to spread and "lay off." Specks will also be seen on the varnished surface, and sometimes are ascribed to dirt. These specks, however, are a direct result of the chilling and consequent congealing of the oil.

The remedy for these troubles is apparent at once. The varnish must be warmed before use, and this is best accomplished by placing the can in a basin of hot water, or near the steam pipes. Do not place the varnish near any kind of a flame, as the fumes are inflammable, and a blaze is apt to result.

Oil stains, which exposed to cold, will freeze, and the color will be precipitated. This makes them useless until they are warmed in the manner just described, and the precipitate color material thoroughly redissolved. Sometimes cheap creosote oils are employed as a base for oil stains. If such a stain is chilled, a precipitate will be found. This is known as "napthalene," a coal tar product. In other words, it is simply "moth balls" in another form. The finisher should at once discontinue the use of such a stain, as reliable results cannot be obtained, and the presence of the napthalene lowers the solvent powers of the oil.

Great care must be used in warming or heating every single material in the finishing room and competent men must be assigned to the work. Explosions in a finishing room can be prevented by care.

Quality in Finishing Material Demanded

Strength, brilliancy, depth and coloring power are qualities which are being demanded in wood dyes with an ever-increasing insistence. The more proficient finishers—the live wires—are satisfied with nothing less than the best when it comes to finishing materials. They know that unless the dyes and other material used, are of a high quality, it is difficult, if not impossible, to produce a satisfactory finish. In these days of high cost it behooves every buyer to secure maximum value, which is not so much a matter of low price as of high quality.

GETTING THE MOST FROM THE SPRAYER

Keeping the spraying machines clean not only gives best results, but also saves power and materials. The exhaust fan must be given particular care. If the exhaust fan is not kept clean it will soon wear out the motors and will eat up power.

Varnish can be removed from fans by immersing them in cans containing a good paint remover. All of the parts should be cleaned at least once a week.

The following preparation will serve well to clean the fans and parts: Four ounces of melted wax in one gallon of alcohol. It is well to keep the spray gun or spray head in a can of this solution when not in use. The hose can also be cleaned with this solution, but must not be allowed to remain in it for more than ten minutes.

When the machine is to be used for shellac, the platform should be cleaned thoroughly, as it should be kept all the time. In some finishing rooms, waste is prevented by placing a large frame covered with cotton at the back of the hood. This will catch a lot of the material which can be recut with alcohol and used again.

Varnish can be removed in a similar manner. Strips of tin can be placed at the side of the platform to catch the surplus varnish. To remove the varnish which adheres to the strips they can be placed in a small tank of benzoin which will soften the varnish and make it easily removable. The same can be done with enamels, using benzol to soften the accumulated material on the tin strips.

The staining table is sometimes constructed so that all waste stain is kept on the platform or is stored in a trough around the sides.

Where Blame Belongs

The finishing room should never be called upon to cover the mistakes of others. The pieces which come to the finishing room should be ready for the finishers in such form that they can do good work upon them. Many a trouble in the finishing room would never happen if the goods brought there had been worked right.

The foreman of the finishing room ought to be a first class "kicker" about the shape in which pieces are brought to his department.

Every foreman knows that it is impossible to do the right kind of work on a surface that is poorly sanded or to get uniform results on surfaces which have not been cleaned in the right manner.

Sometimes the stock of sandpaper with which a sanding has been begun runs out and a different grade is used in that emergency. There is bound to be a difference which will make trouble for the finishing room and chances are that the finishing room will get the blame and the finishing room foreman pass on that blame to his men and the finishes they use. As a matter of fact the fault lies with workmen who have not done a good job before the pieces have reached the finishing room.

If one has never heretofore given this matter thought, and has imagined that the only difference between a well-sanded and a poorly-sanded surface is in the smoothness and can be corrected in the finishing, he would do well to take a board, and after marking it off into sections, sand each section with a different grade of paper. Then take it to the finisher and have him stain and varnish it, or finish it up in the usual way.

It is a comparatively easy matter to make a nice, clean finish on a surface properly prepared, but an impossibility on a surface poorly sanded. The coarse paper leaves scratches with rough and ragged edges, which turn dark from the stain giving the surface a murky appearance. Sanding with fine paper removes these rough and ragged edges, as well as the scratches themselves, if they are not too deep.

"Pitting" or "Pin-holing"

Experts generally agree that "pinholing" or "pitting" cannot be charged against the varnisher as the foundation of the trouble has been laid before the piece comes to be varnished. A variety of causes are given.

In the first place the filler may be too thin for the wood. Then, the pores may not have been sufficiently filled. In the sandpapering, the dust gets in the pores and it is absolutely necessary to clean them out so that the filler can do its work. The filler must never be too thick as when it is it will not get down into the pores. Care in filling will save many troubles later on.

Sometimes there is too much oil put into the filler which makes the filler stick and will not let it get into the pores.

The chemists at the Jamestown Wood Finishing Company have solved these troubles by exhaustive research and experiment and when Jamestown Fillers are used properly, these troubles can never happen.

Pinholes in mahogany veneer can often be traced to the drum sander. This operation packs the pores full of very fine wood powder which holds the moisture of the stain and when the filler and varnish seals this over a gas is generated which must escape and the resultant ruptions cause pinholes. This can be overcome by brushing the piece thoroughly with a rubbing brush and by allowing the stain at least twelve hours to dry.

Glue does not dry solid but is full of pinholes and when this glue gets in the pores these same pinholes are there. The glue is sometimes drawn up far enough in the pores to prevent the filler from filling them and when the filler is consequently rubbed off, the pinholes remain. Some pinholes are due to the use of poor grades of glue which soften under stains.

Cleaning away all dust, using Jamestown Fillers in the right way, and watching the quality of your glues will obviate much trouble.

Selecting the Best Brush

It is always a good idea to use a brush which suits the work in hand. For applying shellac, a rubber-bound, double chiselled, badger-haired brush is considered to be the best, while for brushing varnish, the material can be spread faster with an oval brush of a suitable size. Some finishers use two brushes when varnishing—an oval brush with which to apply the varnish and a flat one for cleaning it off. For good results, the varnish brush should have fine, pliable bristles.

It would prevent waste of sandpaper if some of the sanding drums closed tighter than they do at the present time.

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Will triple the output of your finishing rooms; decrease the congestion in your factory; reduce investment of goods in process and improve working conditions for your employees.

Better finish, scientifically dried from the inside out.

We will analyze conditions in your plant and submit a proposition covering an equipment suitable for your requirements, whether it be for automobiles, talking machines, pianos, furniture or railroad cars.

We have exclusive authority to issue license to use the Grosvenor Process Patent in all territory East of the Mississippi, Ohio and Detroit Rivers in the United States and Canada, the only varnish drying process that simultaneously subjects the coatings to the action of moisture in excess of natural humidity.

We also manufacture the Nichols Lumber Dryers, Veneer Dryers and Hydraulic Pumps. It will pay you to address us for further particulars.

A. S. NICHOLS COMPANY Aeolian Hall **New York City**

Increasing speed and reducing costs while making certain highest quality work, in your finishing room with the

DeVilbiss Spray-painting System

Whether you manufacture phonograph cabinets or chairs, metal cabinets or brass beds; whether you varnish, enamel or lacquer those products, one DeVilbiss spray operator will do 4 or 5 times as much work as a brush finisher in the same time.

On every class and grade of work the sprayed-coating will be of highest, uniform quality—free from brush marks, runs, fatty edges and like faults.

DeVilbiss exhausting equipment will insure a clean, healthful place in which to work, and reduce the fire hazard.

The outfit will be on the joh every day, and cost little to operate and keep up.

These savings and advantages can be had in your finishing room, in the same profitable degree they are now enjoyed in thousands of wood and metal-working plants of every kind.

Let us mail you furthur particulars that meet your individual requirements

The DeVilbiss Mfg. Co.

3718 Detroit Ave. *Toledo, Ohio, U.S.A.*

Manufacturers also of DeVilbiss Spray-painting portable equipment for spray-painting factory interiors and exteriors at a big saving in time and cost.

Linseed Oil has its best equivalent in "FLAXICON." Either in boiled or raw, is elastic, durable and waterproof. Working to the best advantage with colors ground in oil.

Penfound Varnish Co.
CARIBOO AVE. - TORONTO

"ENAMELS"

Our business in both White and Old Ivory Enamels and Primers has trebled during the past year.

WHY?

They are the best on the market. If you are not using them, write for samples and prices.

The
Ault & Wiborg Co. of Canada, Ltd.
Varnish Works
Montreal Toronto Winnipeg

ZERO

Natural West Va. Rubbing Oil

BEST Because that beautiful shining surface becomes almost impervious to finger prints

CHEAPEST Because it goes further on the job than Parafine Oil

ZERO

The Best Products

Mr. Furniture Man, some of the best factories find this to be so. Try for yourself.

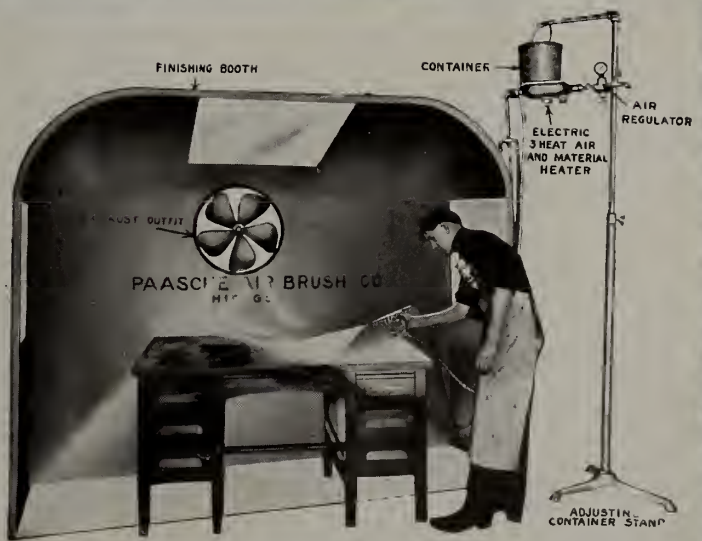
Zero Oil Company
PARKERSBURG, W. Va. - U.S.A.

PAASCHE

Air Works Faster Than Hair

Paasche Air Finishing Devices

Mean
INCREASED PRODUCTION
at
LESS COST
with a
SMOOTHER FINISH
that
WEARS BETTER
(Saves 200 to 300% in Time and Labor)
Intelligent service rendered with installation
WRITE US TODAY.



PNEUMATIC RUBBING MACHINES

are rapidly replacing HAND Rubbing and Polishing. RUBS AS EFFICIENTLY AT 4 P. M. AS AT 8 A. M. Girls Can Operate Them.

Washington Blvd
CHICAGO, ILL.

Paasche Air Finishing Equipment is especially designed for manufacturing use It is the most efficient and economical finishing system known. Unequalled compactness, simplicity, and ease of control are well recognized Paasche features. Paasche Air Brushes never clog or stop up; can be left attached to container at night without getting clogged. The ease and certainty of control in a Paasche outfit results in less waste of material and a better finish.
The superiority of Paasche Air Finishing is proven by its use in hundreds of the largest, as well as the smallest, furniture, woodworking, piano, music cabinet, and chair plants in the United States and Canada.

Paasche Air Brush Co.

Buy and
Build for the Future
The woodworking industry to-day is hungry for quality service. The manufacturer possessed of vision, builds for the future, and ensures his business by a consistent supply of high grade veneers.
There is beauty and permanence in our
Rotary Cut Veneers, Birds Eye Maple, Plain Birch and Maple Veneers
The present prices—the quality of our product—the prompt efficient service, these are good reasons why you should buy now.
Birds Eye Veneer Co.
Escanaba - Mich.
BeVeCo
VENEERS

Veneers and Panels

Veneer Adds Value to Classic Pieces

World's Most Famous Masterpieces Made of Veneer—Practice Dates Back to Earliest Times—Big Factor in Furniture Industry Today.

by William Clendenin, Conover-Mooney Co., Chicago.

Veneer and plywood circles are all agog in view of the big $50,000 campaign of advertising soon to be launched in certain of the leading magazines and trade press reproducing illustrations of some of the finest historic pieces of furniture in existence which research discloses are veneered. We reproduce some of these classics herewith and they are well worthy of

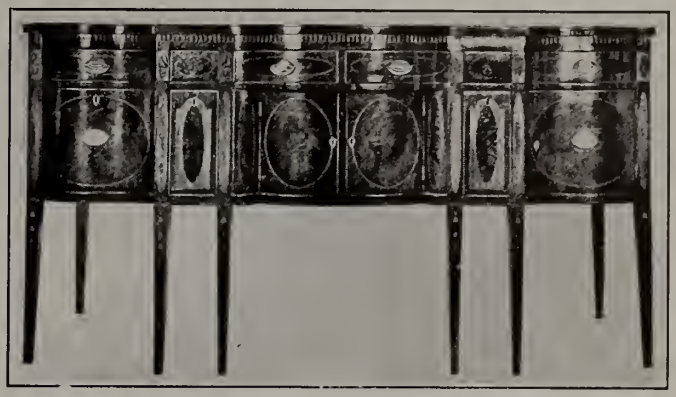
Famous Shearer sideboard made especially for the Bank of England.

the attention not only of the furniture craft generally, both manufacturer and retailer, but of the public as well.

We are indebted to William Clendenin of the Conover-Mooney Advertising Company of Chicago for most of the material of this article. Mr. Clendenin conducted the research work for the Veneer & Panel Association as a result of which the plywood interests united with the veneer on a 50-50 basis and, instead of dropping the word "Veneer" from the trade vocabulary, decided to launch an educational drive to disabuse the public mind of its erstwhile prejudice against veneer—and in this way carry the message to Garcia.

Dates Back Into Antiquity

In a special report to us Mr. Clendenin says: "Not in my whole experience in research work did I ever encounter more discouraging difficulties in the beginning and more complete success as the investigation proceeded. It may be imagined with what surprise we discovered that veneer work instead of being a modern innovation, harks back literally to the dawn of time. In an old English book I found in a foot



Beautiful Sheraton sideboard—Veneer construction used

note a small cut of a mural decoration taken from the wall of the tomb of the Pharaohs of the Exodus, showing in detail the process of veneering in the year 1490 B. C. The authenticity of this illustration is beyond question and an examination of it reveals not only the basewood of sycamore but the surfacing of fine veneer of some more pretentious wood, the glue pot over the fire—the hot sand bags, etc. Subsequent investigation discloses that the ancient Egyptians understood veneer and plywood construction almost along modern lines. There still survive fragmentary specimens of Egyptian veneer work, and it is now known that plywood was used by Rameses in the building of his long boats with which he thrashed the world in those ancient days.

"From Egypt the allied arts of plywood and veneer crept westward through the workmanship of the Babylonians, Persians, Greeks and Romans. The throne of Sennacherib was veneered. One of the

Mahogany bookcase designed by Sheraton for "The Times"

proudest possessions of Tiberius Caesar was a veneered table and Pliny tells us that Cicero paid $45,000 (gold coin of Rome) for a veneered table of citrus-wood. Pliny expatiates at length upon the beauty of veneer and describes in detail the wonderful figure effects obtained by its use such as the panther tables,

Bureau de Campagne of Napoleon

the tiger tables and the table tops whose designs resemble swarms of bees. In still a later book Pliny goes into a paroxysm of wrath denouncing the then practice of using gilt and paint, and he has his "mad" up not because gilt and paint were not handsome enough in their way, but because they covered up the beauty of the veneer.

Common to all nations and all ages

"In this way the story runs through the annals of ancient arts and crafts of nearly all the nations of the ancient world, reviving again with the Renaissance in Italy and sweeping then through France and the Netherlands into England and finally to our own America—the most magnificent furniture creations during each of these centuries having been executed in veneer. For instance, the most sumptuous piece of furniture in the world to-day, the Bureau du Roi, an illustration of which is herewith reproduced, done for LouisXV at a cost of half a million, and which required nine years in the making—was veneered. Indeed, the solid furniture construction has been almost consistently relegated to the barbarians—the Goths, the Vandals and the Huns who hewed their furniture from the solid block, scarcely any of which survives, whereas we have still the classics of veneer intact after the lapse of centuries.

"Napoleon knew a thing or two, and the famous "bureau de campagne" still preserved at Malmaison near Paris, is veneered. This piece is a collapsible cabinet done in rosewood with bands of hollywood. The front, sides and back are veneered. The magnificent writing cabinet and bookcase of Dean Swift preserved in Dublin is a splendid specimen of superb walnut veneer as is also a similar piece formerly the property of Sir Joshua Reynolds. Still another is the beautiful writing cabinet or escritoire, formerly the property of Marie Antoinette. "Francis I of France, dubbed by the cardinal, "king of the Renaissance" induced the best artists of Italy to come to Paris and with that sponsorship began the handicraft of veneer in Western Europe. The palaces of the Louvre and the famous museum of Cluny abound with specimens of their art.

Used and Recommended by Old Masters

"The English Schools and periods soon followed suit and it may come as a surprise, even to the better-informed reader, that Gibbons, Shearer, Hepplewhite, the brothers Adam, Chippendale and Sheraton himself employed veneer in the very choicest of their creations. Shearer executed a magnificent sideboard for the Bank of England which is still preserved. A copy of this is here shown. Sheraton's classic for the London Times is another supreme specimen of veneer as employed by that master of the craft. Innumerable photographs of veneered chairs and bookcases done by Chippendale have been remarkable in the course of our research as background and illustrative material for our advertising campaign. Sheraton even went so far as to set forth in his books elaborate instructions for the proper laying of panels and instead of veneer being a despised counterfeit, or a substitute camouflage, as is mistakenly supposed by many, it is and has been from the beginning, a fine art of the highest order and recognized as such by the foremost producers of fine furniture in every land and in almost every period.

"The writing desk of George Washington was veneered. The magnificent sideboard ordered by John Hancock for his new home in Boston was veneered. The desk upon which Thomas Jefferson wrote the Declaration of Independence was veneered. The little writing desk of Dolly Madison was veneered. They still show you an old desk once the property of Daniel Webster and now preserved at the Wayside

Continued on Page 100

Bureau Du Roi, made for Louis XV at a cost of $500,000

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

THE OHIO VENEER COMPANY

Importers and Manufacturers

Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, CINCINNATI, OHIO.

Mahogany and Walnut Veneers

Veneer department at New Orleans, La., showing 10-ft. Rotary and Clipper and 16-ft. Slicer in rear.

Chicago Offices — M. S. Johnson, 39 W. Adams St.
Toronto — J. R. Kennedy, 50 Front St., E.
Grand Rapids — Geo. A. Baker, Hotel Cody.

THE FREIBERG MAHOGANY CO.

Offices and Warehouses:
CINCINNATI - OHIO

Saw and Veneer Mills:
NEW ORLEANS - LA.

Mahogany Importers and Manufacturers

Western Office, 516 Lumber Exchange, MINNEAPOLIS, MINN. Mills at GLADSTONE, MICHIGAN

The Northwestern Cooperage & Lumber Co., Gladstone, Mich.

THE HOME OF "PEERLESS" STANDARD BRAND PRODUCTS

Manufacturers of

"PEERLESS" ROTARY CUT VENEERS

in Birch, Elm, Basswood, Maple, Ash and Beech for all purposes

Also hoops, liners and staves for manufacture of packages

Also "Peerless" Rock Maple, Beech and Birch flooring; Hemlock lumber; Lath, etc.
"Peerless" products are standard everywhere and you are always exercising Safety First in using them. Try us next time.
(When writing mention Canadian Woodworker)

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SAVE FREIGHT

Rotary Cut Birch and Gum

Why pay freight on gum veneers from southern points when our cutting mill is so near the border.

PANELS

We manufacture Tops, Fronts and Panels of all kinds

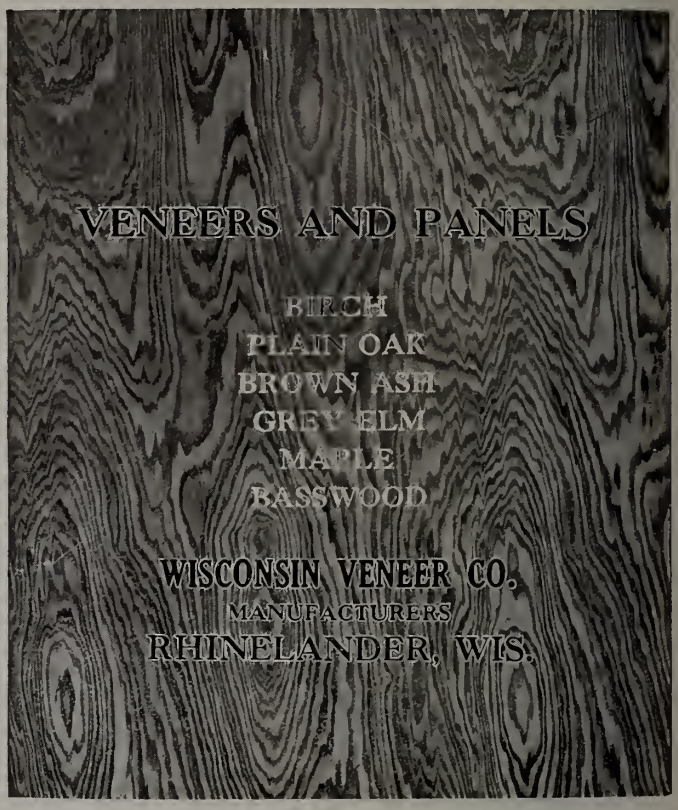
Ask for our "Ready to Ship" Stock List

MOHAWK VENEER CO., INC.

Warren, Pa.

Plywood Dept. Warren, Pa.

Cutting Mill Salisbury Center, N.Y.



Litton Veneer Co.

Manufacturers

American Walnut, Figured Gum, Sliced Quartered Oak, and all Kinds of Figured Woods

Walnut and Quartered Oak Lumber

Office and Mill

ROCKFORD - ILLINOIS

J. W. Frye Lumber and Veneer Co.

Dayton - Ohio

Manufacturers and Wholesalers

Specialize in

Walnut Lumber and Veneers

Oak Lumber and Veneers

Also All Native Hardwoods

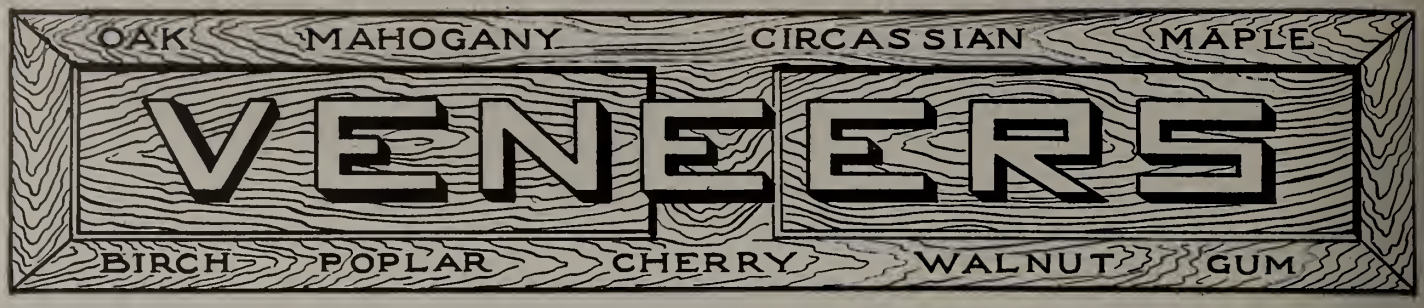
Guarantee all stocks to be Ohio and Indiana grown

ESTABLISHED-1867 HB INCORPORATED-1904
Req. U.S. Pat Off.

THE solid success which has attended this company's half century of business is attributable to its having established high ideals through direct personal contact with its customers. During the current period of transition, many buyers may have difficulty in establishing satisfactory supply connections for strictly high-grade hardwood lumber and veneers. May we suggest that through personal contact we are confident of our ability to demonstrate that our selection of genuine northern grown oak, walnut, maple, ash and other major species, and our rotary cut poplar, is sufficiently varied to prove a genuine asset to any discriminating buyer, and that this concededly superior product is just as good to day as was the original stock manufactured on the same site fifty or more years ago. Surely it will pay you to know us better.

HOFFMAN BROTHERS CO.
FT. WAYNE, INDIANA

·LIVEZEY·



Poplar and Walnut
Veneers

We specialize in large size poplar veneers as we have extra fine poplar logs. We can cut veneer up to 10 feet square.

Our walnut veneer cannot be beat, both in plain and figured wood.

Write us for prices.

Central Veneer Company
Winter Ave. and Belt R. R., INDIANAPOLIS, IND.

Sovemanco
Southern Veneer Manufacturing Co., Inc.
LOUISVILLE, KY.

Importers and Manufacturers of all kinds of Sawed, Sliced and Rotary-cut

VENEERS

CARRYING

a large stock of selected Mahogany, Figured and Plain Walnut, Walnut Butts, Sawed and Sliced Quartered Oak and Sycamore and all other native woods.

1,000,000 Feet
QUARTERED RED GUM
to select from

WE Respectfully solicit your inquiries

C. E. CURTIS & BRO. CO.
2422 S. Western Ave.
CHICAGO, ILL.

SUPPLYING HIGH GRADE

Veneered Panels

IN ANY SIZE, THICKNESS OR KIND OF WOOD

Immediate Shipment on all Stock Sizes in Walnut, Plain Oak, Birch, Mahogany, Etc.

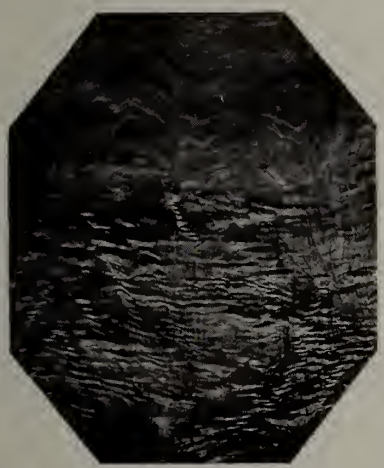
Wide Veneer

One carload of 1/20″
Quartered White Oak
Sawed Veneer
12″ and wider

Ready for Quick Shipment.

Memphis Veneer & Lumber Co.
MEMPHIS, TENN.

The Bachman Plant —and the Bachman Product



A sample of beautifully figured Walnut Stump Wood

Here, in this large and fully equipped plant, Bachman quality veneers are made. Our extensive yards are piled high with carefully selected, choice Indiana White Oak, Walnut and Gum.

Bachman veneers are cut full thickness, which means plenty of wood for sanding and a minimum of breakage in handling.

Bachman's forty years' experience in hardwood sawing is evidenced in every piece of veneer that leaves the plant. The sawed stock can scarcely be told from the sliced.

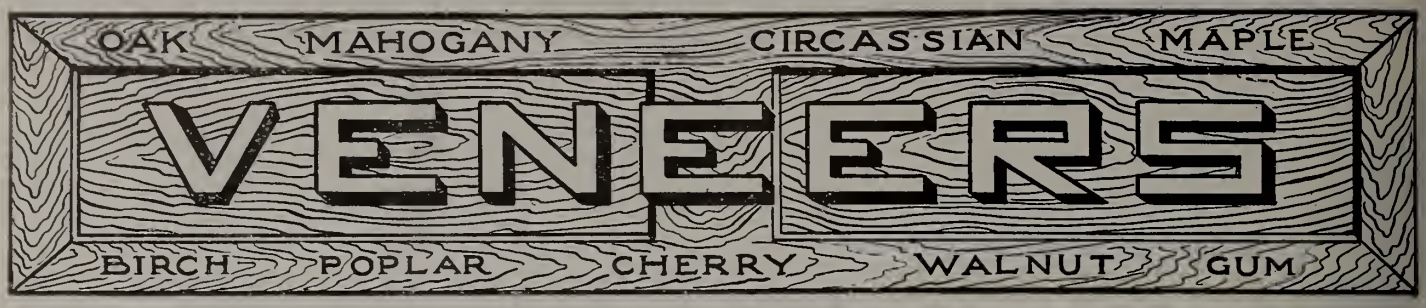
These are a few of the reasons why our customers tell us they get *fifty per cent. more panelling out of Bachman veneers* than they can from average veneers.

It is this unchanging high standard, both as regards materials and workmanship, that has made possible forty years of successful business. It is your assurance of the utmost in quality and service.

No order is too small to receive our prompt and careful attention—none too large to be handled to your entire satisfaction.

F. M. BACHMAN COMPANY

Indianapolis



INVESTIGATE

P.-J. SERVICE

For high-grade rotary cut veneer, that is smooth and evenly cut and dried by mechanical means to any percentage of moisture desired.

We also operate large band mills where all kinds of southern hardwood lumber is cut from our own tract of timber in the very heart of the Saint Francis Basin District, Arkansas.

PENROD-JURDEN COMPANY

A Name that Should be on your Enquiry List for both Veneer and Lumber

Mills at Helena and Penjur, Ark. General Offices: Memphis, Tennessee.

Penrod Walnut and Veneer Co.

KANSAS CITY, MO.

Exclusive Manufacturers American Walnut Lumber and Veneers

AMERICAN BLACK WALNUT LUMBER

FAS—6-9¾" Wide, 8-16" Long

3/8"	3,750 Feet
1/2"	21,470 "
5/8"	44,140 "
3/4"	25,962 "
4/4"	82,502 "
5/4"	26,766 "
6/4"	39,201 "
8/4"	33,140 "
10/4"	14,245 "
12/4"	11,470 "
16/4"	3,700 "

FAS—10" and Up Wide, 8-16" Long

1/2"	9,680 Feet
5/8"	18,980 "
3/4"	14,430 "
4/4"	48,872 "
5/4"	14,165 "
6/4"	10,262 "
8/4"	16,920 "
10/4"	10,250 "
12/4"	1,800 "
16/4"	2,100 "

Fas—6"and Up Wide, 6-7 Feet Long

3/8"	1,200 Feet
1/2"	5,790 "
5/8"	840 "
3/4"	8,940 "
4/4"	32,400 "
5/4"	2,300 "
6/4"	7,800 "
8/4"	1,500 "
10/4"	1,400 "
12/4"	500 "
16/4"	400 "

SELECTS

4/4"	32,940 Feet
5/4"	27,530 "
6/4"	21,480 "
8/4"	33,590 "
10/4"	16,850 "
12/4"	6,054 "
16/4"	1,332 "

NO. 1 COMMON

3/8"	8,000 Feet
1/2"	27,380 "
5/8"	29,850 "
3/4"	31,285 "
4/4"	59,675 "
5/4"	38,240 "
6/4"	18,750 "
8/4"	39,240 "
10/4"	16,363 "
12/4"	4,768 "
16/4"	1,604 "

NO. 2 COMMON

3/8"	1,500 Feet
1/2"	1,900 "
5/8"	4,500 "
3/4"	2,100 "
4/4"	72,250 "
5/4"	47,890 "
6/4"	31,720 "
8/4"	35,940 "
10/4"	19,140 "
12/4"	20,116 "
16/4"	16,088 "

Write for prices on any items you are interested in *"PENROD SERVICE" Satisfies*

C. A. Rugg, 115 Foots Avenue, Jamestown, N. Y., Eastern Representative.

Geo. C. Hall, 610 South Michigan St., Representative for Chicago and Michigan territory.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

VENEER MANUFACTURERS COMPANY

Manufacturers and Importers.

Our Almost Unlimited Resources Places at your Disposal the Greatest Assortment of

Single Ply Veneer in Rotary Cut, Sliced and Sawn, Plain and Figured Woods

and

Plywood Panels of all Kinds

Ever placed under one roof.

We maintain a standard for Quality, service and fairness that cannot be equaled.

Send for The Veneer Price-Stock List.

1036 W. 37th. St. Chicago, U. S. A.

QUALITY *SERVICE*

PICKREL VENEER COMPANY, Inc.

MANUFACTURERS OF

American Walnut

Exclusively

Woodruff and River *New Albany, Ind.*

Branch Sales-Offices & Show Rooms:

NEW YORK-709 Sixth Ave. (at Forty-First St.)
CHICAGO-28 East Jackson B'l'v'd
JAMESTOWN, N.York
HIGH POINT, N.C.

Quality VENEERS in

WALNUT BUTTS ◎ OAK ◎ LONG WALNUT BURLS ◎ MAHOGANY ◎ POPLAR

The WILLIAMSON VENEER Co.

VIEWS OF OUR PLANT No. 4 H.G.W. Del

ALGOMA *the Better* Plywood

We welcome the man from Missouri

This is a message to the man who "has to be shown." There's nothing we should like better than the opportunity of proving to you that Algoma is the Better Plywood. Set your own standards or follow ours. Make your test as rigid as you like, and see if this plywood does not make good.

Our tests are these: *Surface*—permanently smooth, does not require re-sanding. *Graining*—skillfully matched and free from blemish. *Gluing*—uniform and everlasting. *Cutting*—accurate in each dimension to a fraction of an inch. *Delivery*—as speedy as a large, efficient plant can make it.

Be a regular skeptic if you will—but give us one opportunity to prove our case. Order your next plywood from Algoma.

ALGOMA PANEL COMPANY, *Algoma, Wis.*

How Stiff is Your Spine?

"A little factory was started in a small town in Georgia," says a writer in Printer's Ink. "The owners were good workmen and knew how to make a cheap staple article, but they knew little of costs or of the market. When the factory got going they sent out a saleman who travelled all over the South and sold these staple goods at 20 to 30 per cent below the market price.

One big Atlanta house heard of this competition and met the price. Then a Chattanooga salesman reported that Atlanta had cut, so Chattanooga met Atlanta. Memphis met Chattanooga's price, and then New Orleans and Nashville met Memphis, and so on until the entire product of this staple was sold at a loss. After the first cut, nobody remembered who started the fire. At the end of a year—after one million dollars' worth of this staple article had been sold at a loss—the little factory that started the trouble failed, and it came out in court that their total sales for the year were only $$22,000!"

Your business is "different" of course, But: When a little one-horse competitor starts cutting prices, do you have to follow suit? When the buyer tells your salesman "I can get better terms from So-and-So," does the salesman wilt, or can he stand up to it? In other words, do your competitors and your prospects regulate your prices and terms, or do you regulate them yourself?

To put it more briefly--How Stiff is Your Spine?

Accidents Not Always Accidental

It sometimes occurs that delays and breakages which seem accidental are the result of a grievance, whether imaginary or real, on the part of some employee.

A sawmill at Smith's Falls, Ont., was bothered for several weeks with a number of seemingly unexplainable breakdowns. Belts broke mysteriously. Something was seemingly going wrong with the equipment every few hours. Parts of the machines became loose, dropping off and often doing considerable damage. Finally it was suspected that these were not altogether accidental, and a watch resulted in placing the blame upon a youth who had been but recently employed in the plant. It seems that this young man was being forced by his father to work in the sawmill, and, disliking the work extremely, took this method of obtaining relief. It is probable that Alex. Root, the lessee of the mill, will collect a bill of damages from the father of the boy.

A tightening pulley on the belt is better than dope or a slipping belt, but one which is wide and heavy enough to carry the load is better than dope or a tightening pulley.

100% EXCELLENCE

Manufacturing
High Grade ROTARY CUT VENEERS
Specializing BIRCH DOOR STOCK,
MAPLE PIANO PIN BLOCK STOCK

Years of Experience Behind Our Products

The Munising Woodenware Co.
MUNISING, MICH.

MAINE BIRCH VENEERS

THE BEST IN THE WORLD

The Standard Veneer Co.
Portland, Maine

Emerson Says—

"If a man can write a better book, preach a better sermon, or make a better mouse trap than his neighbor, though he build his house in the woods, the world will make a beaten path to his door."

Altho' we have only been in business for the past eighteen months we can see unmistakable signs of the beaten path already.

The Answer is:—
WE DELIVER THE GOODS.

R. R. May Hardwood Co.
LOUISVILLE, - - - KY.

THE loss through degrading, the time wasted and the uncertainty of knowing whether or not the work was done right, which in former years attended transit kiln-drying, can be eliminated by use of the 500,000 feet capacity modern kilns of the Wood-Mosaic Company at Louisville, Kentucky. These kilns were designed and erected after many years' experiences and exhaustive investigations. They are manned by intelligent and carefully trained operators. The results on the many millions of feet already dried have been scientifically checked and found correct. Under a very favorable transit arrangement a percentage of their capacity is offered to shippers who want to *know* that their lumber is perfectely kiln-dried. We offer our own stock either kiln-dried in the same efficient manner, or properly air-dried in quartered and plain white oak, in walnut and in other hardwoods. Our sawed white oak veneers, sliced and rotary cut walnut, rotary cut yellow poplar cross banding are just as carefully made and dried. The stock of both lumber and veneers still permits a good selection if you act soon.

WOOD-MOSAIC COMPANY

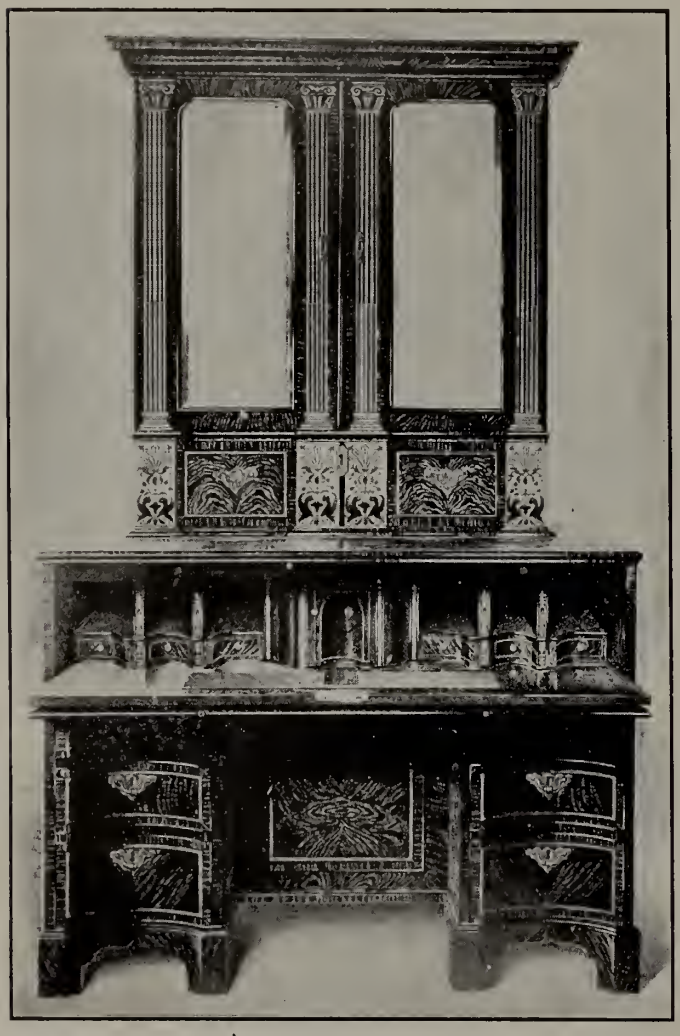
LOUISVILLE INCORPORATED KENTUCKY

Veneer Adds Value to Classic Pieces

Continued from Page 88

Inn at Sudbury, Mass., and it is veneered. This is easy to understand when we remember that the finest furniture of our forefathers was imported from England at the height of the Chippendale, Hepplewhite and Sheraton periods and their art was naturally followed by the craftsmen of New England who did the best they could to imitate it. Collectors of old furniture need no detailed description of the priceless examples of veneer which have found their way to America and are to-day the treasures of many of the oldest and most famous families of the United States.

"It will be readily appreciated what a wealth of material these classics will supply for our advertising



The Dean Swift writing cabinet and bookcase—Walnut veneer

campaign and we seriously doubt if so complete an exhibit has ever before been assembled on this or any equivalent line. It is conclusive of the fact that Veneer has had the sanction of art and artists always, and the general public needs but to be reminded of it all in order to restore veneered furniture to popular preference.

Plywood to Receive Equal Attention

"Hand in hand with the veneer feature of our campaign we shall treat also of plywood and the extraordinary economies in its manufacture introduced in the plywood factories of this country. Part of every ad and all the follow-ups will be devoted to a brief discussion of plywood and its rapidly extending uses and potential uses. Among these may be prominently mentioned the marine field and the fact that bulk heads, partitions, upper deck constructions and the like are now being specified in plywood. Recently the police department of the city of Chicago ordered the bodies of patrol wagons to be built of plywood, they having been found upon test to be not only superior to steel in lightness but also bullet-proof and bandit-proof. Wood cuts are now almost exclusively built up on the plywood principle. Panel work is being standardized in plywood with fine surfaces of rich veneer. Automobile wheels have been constructed and are being found practical even in dished formation—of plywood. These and many others besides automobile and aviative construction are of plywood.

"Expert reports from technical institutions definitely affirm the superiority of plywood because of its resiliency and stamina of construction. The grains of the alternating layers being at right angles and the plies bound together with glue under heat and pressure to give resistance to shear and stress superior to any other construction known. The plywood feature therefore, becomes of constantly increasing importance and the wonderful progress in perfection of veneer work in the Western World makes altogether a subject for advertising which it is believed cannot fail to impress and influence the buying public in a substantially constructive and profitable degree.

"Much is expected of this campaign and in view of the extraordinary exhibits, tables, facts and figures which have been adduced in support of it, it may be reasonably predicted that as an educational movement, the campaign can hardly fail to take high rank."

Little Time Losses

The importance of little things is often overlooked. When a workman is two or three minutes late for work or loafs that long during the day, he does not think very much of it, but if each workman in the plant loses the same amount of time, the loss of time begins to assume larger proportions. Then if this is multiplied by 300 days, it looms up as a serious item.

This point was brought out in an article which appeared recently in the "Curtis Circle," the house organ of the Curtis Companies, Incorporated. This item is as follows:—"For round numbers let us assume that there are 2000 employees in the Curtis Companies. If each one of them were to waste 5 cents worth of the company's time to-morrow, the total waste for the day would amount to $100.00. This would grow to $600.00 in a week, and figured on a yearly salary basis, would mean a loss of $30,000. Just 5 cents of lost time per day per employee, it seems small, in time it would not be much more than 6 or 7 minutes, yet figured on a yearly basis, it amounts to $30,000 a year."

It is startling how important little things become when looked at collectively or in their true perspective. The success of any industry depends as much upon the efficiency and ability of the employees as on the policy and judgment of the management.

The average workman imagines that the managing part of a business is the softest job in the works. He is mistaken, as it takes brains and real executive abilities to make success of any business.

Toronto Veneer Company Ltd.

(Operating Panels, Limited, Southampton, Ont.)

Office and Veneer Warehouse:
1100-1104 Queen St. West
Toronto

LumberYard:
Atlantic Ave. and G.T.R. tracks
Toronto

PATENT "RIM-BOUND" TABLE TOPS

Write Us for Full Particulars

PANELS 3 AND 5 PLY IN ALL WOODS.

TORONTO LUMBER STOCKS

MAHOGANY

3,169′	4/4 1s & 2s
4,780′	4/4 No. 1 Com. & Sel.
65′	5/4 1s & 2s
134′	5/4 " 1 Com. & Sel.
44′	6/4 " 1 Com. & Sel.

BLACK WALNUT

16,382′	4/4 x 10″/up 1s & 2s
1,275′	4/4 x 6 -9¾″ 1s & 2s
17,584′	4/4 No. 1 Com. & Sel.
2,762′	5/4 1s & 2s
4,407′	5/4 No. 1 Com. & Sel.
3,383′	6/4 1s & 2s
3,269′	6/4 No.1 Com. & Sel.
3,824′	8/4 1s & 2s
2,970′	8/4 No. 1 Com. & Sel.

WHITE WALNUT

284′	4/4 1s & 2s
255′	4/4 No. 1 Com. & Sel.
171′	4/4 No. 2 Common.

SOFT YELLOW POPLAR

1,288′	4/4 1s & 2s
924′	4/4 Saps & Select
823′	4/4 No. 1 Common
2,752′	5/4 1s & 2s
1,600′	5/4 Saps & Select
447′	5/4 No. 1 Common
762′	6/4 1s & 2s
951′	6/4 1s & 2s
736′	6/4 No. 1 Common
1,426′	8/4 1s & 2s
838′	8/4 Saps & Select
207′	8/4 No. 1 Common
12′	10/4 Select
1,047′	10/4 No. 1 Common
195′	12/4 1s & 2s
81′	12/4 Saps & Select
558′	12/4 No. 1 Common

QUARTERED WHITE OAK (Soft Indiana)

15,968′	4/4 1s & 2s
28,053′	4/4 No. 1Com. & Sel.
5.000′	4/4 x 2½-5½″ Clear Strips
431′	5/4 1s & 2s
4,912′	5/4 No. 1 Com. & Sel.
1,326′	6/4 1s & 2s
7,002′	6/4 No. 1 Com. & Sel.
1,430′	8/4 No. 1 Com. Sel.

PLAIN WHITE OAK (Soft Indiana)

5,020′	4/4 1s & 2s
13,431′	4/4 No. 1 Com. & Sel.
2,957′	5/4 1s & 2s
2,973′	5/4 No. 1 Com. & Sel.
974′	6/4 1s & 2s
2,507′	6/4 No.1 Com. & Sel.
184′	8/4 1s & 2s
2,288′	8/4 No. 1 Com. & Sel.

QUARTERED RED OAK (Soft Indiana)

684′	4/4 1s & 2s
9,139′	4/4 No. 1 Com. & Sel.
3,688′	4/4 No. 2 Common

PLAIN RED OAK (Soft Indiana) ...

13,035′	4/4 1s & 2s
21,124′	4/4 No. - Com. & Sel.
2,429′	5/4 1s & 2s
791′	5/4 No. 1 Com. & Sel
1,778′	6/4 1s & 2s
1,363′	6/4 No. 1 Com. & Sel.
2,092′	8/4 1s & 2s
4,306′	8/4 No. 1 Com. & Sel.

PLAIN RED GUM

7,672′	4/4 No. 1 Com. & Sel.
247′	6/4 No. 1 Com. & Sel.

PLAIN SAP GUM

18,000′	4/4 x 13″/up 1s & 2s
18,000′	6/4 1s & 2s

QUARTERTD RED GUM

1,370′	6/4 1s & 2s
2,329′	6/4 No. 1 Com. & Sel.

QUARTERED RED GUM S.N.D.

15,198′	4/4 1s & 2s
8,160′	5/4 1s & 2s
3,969′	8/4 1s & 2s

We are prepared to quote attractive prices on the above, and if required, can kiln-dry and dress any of this to your order.

We are prepared to quote on anything in Hardwoods for shipment direct from the mills in car lots, and solicit your inquiries. We are cutting Gum, Chestnut, Walnut and Mexican Mahogany, and have dry stocks at Jackson, Tenn. and Indianapolis, Ind.

What Causes Defects in Veneered Stock

Causes Not Always Obscure or Hard to Find—Glaring Mistakes Countenanced in Many Plants—Good Plan to Place Blame Where it Belongs

By R. N. Y.

What causes defects in veneered stock? This is a question, which if it were possible to give the correct answer, would mean the eliminaiion of the scrap or cull pile of the average glue-room, and a material reduction in the price of the finished product. Since the advent of veneered or built-up work, a perfect product has been the ambition of every glue-room foreman. Despite all precautions taken to overcome defects we have found and still find, veneered work which is defective. We will briefly discuss some of the causes that often result in the best work proving defective a short time after it has left the glue room.

How Many Operations For Five-ply?

Writers for some time past, and men well versed in veneering operations, continually harp on the subject of gluing up these five-ply stock in two operations From their point of view their contention may be alright. This, however, is not saying that if a five-ply panel is glued up in one operation it is bound to go bad. Far from it. I know of several plants turning out five-ply stock, in one operation, and they have considerably less trouble with their stock than some of the glue-rooms which adhere to the plan of two operations for five-ply. Personally, in my experience as glue-room foreman, I have never considered it necessary to make two operations of a five-ply job, and I daresay I have had considerably less trouble with my stock than they have in plants where the two operations for five-ply plan is in vogue.

My reason for doing this work in one operation is this,---when you build up a five-ply panel in two operations, you set up all the stresses and warping tendencies at each operation. Consequently despite all the precautions you may take against the panel going wrong or warping, your chance for setting up a warping or twisting stress, is just increased 100 per cent. Now take this same panel and complete your gluing in one operation and your warping tendencies are combined in that one operation. With one operation in gluing, all the tendencies to warp are present only once, and when the glue sets, it is not again disturbed with the result that little or no warping occurs if the panels are put through the proper drying process.

A chestnut core, with whitewood crossbanding and mahogany or walnut faces, would be an ideal combination work. Of course paper would have to be laid between the faces to prevent sticking together.

Starving the Glue Joint

It is safe to state that more veneer work is spoiled through glue starvation than from any other cause. If the glue-room man happens to waste or have a little glue squeeze out when putting his stock under pressure, he is often accused of wasting the company's money. However, if the manager would only realize what money is wasted through increasing the cull pile of veneered stock, he would probably change his tactics.

It is true, glue does cost money, but so also does the stock that is spoiled on account of the glue starvation. To play safe the glue-room man should be allowed to use his own discretion. It is far safer to use plenty of glue on the crossbanding and face veneers, even though some is squeezed out when in the press, than to spoil several panels or perhaps the entire lot. When you see glue running down the sides of a bunch of panels, it does not necessarily mean a waste of glue, as one panel spoiled would often pay for a lot of glue waste, considering the small amount that is really wasted in this manner.

If any defective veneer work occurs it is generally thought that the glue-room man is becoming careless and that a change of glue-room men would be for the best interests of the firm. This, however, in the majority of cases is a gross error. The majority of glue-room men would rather lose part of their week's wages than have some of their work turned out, go wrong.

Faulty Joints Responsible

The experience of a plant operating a veneering department in which the waste on the glued-up stock totalled over 15 per cent, may be of interest. The stock would seemingly leave the glue room in good condition; yet when the parts were being assembled fully 15 per cent of the panels were laid out as defects. Finally an investigation was made and this is what the investigation developed. Instead of testing his joints against light, the man taping these veneers was trusting to good luck that they were O. K., with the result that many panels were laid out on account of open joints. When he was instructed to examine every joint and that henceforth he would be held responsible for all defects of this kind, the trouble ceased.

Sanding through the face veneers was another source of trouble. The sander man laid the fault on the glue-room man, claiming that the panels were not flat on the ends. Investigation showed that the men taking stock off sander would lift up the panel when nearly through the sander, which caused the face veneer to be sanded through on many panels. When the sander crew was told that in the future they would be held responsible for such trouble, thereafter, strange to say, it was rarely that the face would be sanded through.

Trim Sawyer to Blame

At the trim saw many panels were found that had short veneers on. The trim sawyer blamed this on the glue-room man. Investigation, however, proved that while a few panels had veneers that did not cover the cores, this was greatly increased by the trim sawyer who was cutting from two to five panels at a time, not taking time to gauge the panels so as to trim those properly where the veneer had slipped a trifle. The remedy was obvious. The trim sawyer was told to equalize the cut so as to make the veneer cover the core on which it had slipped. While the glue-room was responsible for the slippage of veneers, this nevertheless did not permit the trim sawyer to try to run this percentage as high as he could.

Walnut, Quartered White Oak and Mahogany Veneers and Lumber

Prompt Delivery

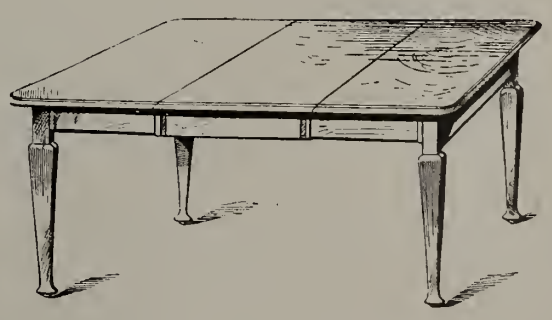
LONG-KNIGHT LUMBER COMPANY
INDIANAPOLIS, IND.

VENEERED TABLE TOPS

WALNUT - MAHOGANY - QUARTERED OAK

PROMPT delivery in any quantity at very attractive prices. Just let us know your requirements and we shall be glad to forward quotations.

Panels are made in Walnut, Quarter Oak, Birch, etc. Large sizes (72x24; 60x30; 60x24; 56x25; 60x20; 60x18; 48x18) carried in stock at all times.



HAY & CO., Limited Woodstock, Ont.

The Lumber Market

Domestic Woods

The local lumber market is still in the throes of stabilization. The demand for certain items has shown a distinct improvement during recent weeks while there is little call for other lines. Naturally prices are reflecting this movement. The cry of better business has gone forth and the future is being regarded with greater optimism. Sales cannot be said to approach anything like normal, and, in fact, are not expected to until spring, but the change from the unsettled conditions of the past months to one in which there is a demand for wood and wood products, is most encouraging. The lumber business is still spotty but the tendency is toward a steadier market. The consensus of opinion seems to be that the total volume of lumber sales made during October was greater than for any month during 1921.

Local hardwoods are moving more freely, furniture factories and other wood-consuming industries are coming into the market and the demand for birch, maple, ash, elm, chestnut and oak is stronger than has been experienced for many months. That being the case, it is only natural to expect a greater stability with regard to lumber values; in fact prices on several lines, and particularly on the better grades, are advancing. The buyers coming into the market to-day mean business. They realize that now is the opportune time; in fact they realize that they have delayed their buying a trifle too long. As a consequence there is less bickering over prices. It is a case of procure the stock at a fair market value. As yet the call is chiefly for the better grades but the lower items are gradually feeling the increased pressure.

In the softwoods white pine exhibits greater activity than it has for some time although this wood has held up well during the whole season . Hemlock is evincing a tendency to stiffen in price, and it would appear as if values in this wood have reached and passed the low market. Several sales running into millions of feet are reported. It is problematical just what the future holds, though the general impression has been that business in general will show a slow but steady improvement. That being the case, the demand for lumber should be fairly steady. With anything like a normal demand during 1922, lumber value will, probably, stabilize at a point considerably above to-day's quotations. Stocks of all woods are none too plentiful. This would seem to indicate a shortage in certain lines if the demand improves and holds.

It is difficult to predict what the cut for the coming season will be although those who are in closest touch with the situation are of the opinion that in Ontario it will amount to 50 to 60% of last season; 30 to 50 % in Quebec; 25% in New Brunswick and 20% in Nova Scotia. However, as time goes on, if the demand for lumber remains on a satisfactory level, it is possible that many operators, not intending to go into the woods, will decide at the last minute that there will be a fair market for anything they might take out, and put their crews into the woods. For the same reason some of the loggers and sawmill men, who contemplate cutting on a reduced scale, may decide to increase their operations. Another factor that should be considered is that on a falling market there is a tendency to curtail buying, orders being placed on a hand-to-mouth basis. When this condition changes the reverse holds true and many rush in and buy to cover for future requirements. This may happen during the next few months. For this reason it does not seem to be a wise policy to postpone the purchasing of needed material for any extended period.

Imported Woods

The demand of American hardwoods continues to show an improvement, with the result that the upward trend of prices, which was noticeable at last writing, is now more marked. The stocks of all the better grades are very low and there is keen competition between buying interests for such material as is available. In addition to the improvement in buying on the part of domestic users, several good-sized orders have been placed for shipment overseas. It is estimated that in the past fortnight over 10.000, 000 feet have been secured by export buyers. The local demand comes from all sections of the wood-using industry, which would seem to indicate that the slight improvement which has taken place in general business is being reflected in all branches of the woodworking industry.

A number of lumber firms in the southern producing districts report that they are practically out of all grades above No. 2 common and that their stocks of No. 2 and No. 3 common are being depleted at a rapid rate. Those who have lumber for sale are not making any attempt to push sales, being content to wait future developments in the belief that lumber prices are bound to advance to a considerable extent during the coming six months.

There does not seem to be any doubt but that as far as lumber is concerned, the low point was reached in August and that since then there has been a change for the better as far as demand is concerned, and a greater stabilization of lumber values. When one considers that owing to the fact that production is at a very low ebb, probably 15% of normal, that logging operations have ceased in many districts and that it takes about six months before logs felled at the present time, can be manufactured and dried to shipping condition, it would appear as if the prospect of lumber being scarce during the next twelve months, is almost a certainty.

It is expected that the gradual increased demand for hardwood lumber and the higher prices which are prevailing, will tend to stimulate production, but on the other hand, it is pointed out by those who are in close touch with the situation, that the logging crews are widely scattered and that the logging equipment which has been laid up, cannot be put in operation on a day's notice; indeed it is emphasized in some quarters that even with a continuance of favorable weather for the whole of the present month and a good part of December, the chances are against an accumulation of any considerable supply of logs.

Summing up the whole situation, it would appear as if a buy now policy is the only one to adopt. While the increased demand has been largely for the upper grades, yet it is gradually reaching the cheaper items. If the present activities continue for any extended period, and there does not seem to be any reason why they should not, all items will be scarce and hard to secure in the course of a month or two.

WHAT about your future hardwoods? It is obviously no time to preach Lumber "shortage" and we have no such purpose. But it is true that practically no lumber is being made and present shipments are slowly, but surely, wearing down stocks. It is only a question of time when there will be nothing left but a broken lot of low grade for there is no physical possibility of measurably increasing production for many months.

Now comes the easing of the cotton situation—releasing the money with which to carry present mill stocks. Our judgment is by no means infallible, but doesn't it look to you as though these circumstances would make it a logical time to buy at least a moderate stock? We have further information that would be of vital interest to any lumber buyer who will address us.

ANDERSON-TULLY COMPANY

MEMPHIS TENNESSEE

News of the Trade

The Ontario Show Case Co., 321 King St., Toronto, are installing a new boiler.

The Comet Washer Co., London, Ont., are erecting a factory at a cost of $3500.

The Spiesz Furniture Co., Limited, Hanover, Ont., are installing a C. M. C. double-end tenoner.

The Simpson Planing Mill Co., Spadina Ave., Toronto, recently installed a C. M. C. chain mortiser and Greenlee sash relisher.

J. Walkom recently passed away at his home in Stratford. He was one of the partners of the Perth Carriage Works, Stratford, Ont.

Edward Van Eck, representing the Kane Mfg. Co., Chicago, recently called on the Canadian trade and found conditions very satisfactory.

The Owen Sound Chair Co., Limited, Owen Sound, Ont., have commenced work on a 20 x 50 brick addition, to be used as a bending room; cost $3000.00.

The Grimsby Steel Furniture Co., Limited, Grimsby, Ont., have secured a site on which they propose to erect a plant to manufacture ice cream parlor and restaurant furniture.

A report recently issued by the Montreal Association for the Blind, shows that 356 cane chairs and 50,000 brooms were manufactured during the past year by the pupils of this Association.

P. E. Shantz, Preston, Ont., manufacturer of baby sleighs and factory trucks, reports business as being very satisfatcory. His plant is being operated to capacity with a full staff of employees.

The James Brooks Woodworking Co., Limited, New Westminster, B. C. have been awarded the contract for the millwork for the new nurses' home which is being erected at Tranquille, B. C.

A. E. Malcolm, of the Andrew Malcolm Furniture Co., Limited, Listowel, Ont., was recently nominated as a Liberal candidate in the forthcoming federal elections. Mr. Malcolm is at present mayor of Listowel.

The Canadian Sawdust Co., Limited, Montreal, were incorporated recently to carry on a general woodworking and contracting business capital $100,000. F. B. Common and F. G. Bush are two of the incorporators.

Meredith Simmons & Co., Limited, Toronto, were recently incorporated to manufacture and deal in glues and other adhesives; capital $50,000. J. S. Beatty and J. R. Rumbell, Toronto, solicitors, are among the incorporators.

The hockey stick factory operated by E. B. Salyerds at Preston, Ont., was recently destroyed by fire. The factory and equipment are a total loss. The damage amounts to about $30,000. and is partially covered by insurance.

Giles, Rice & Peters, Limited, Toronto, were recently incorporated to manufacture and deal in motor vehicles of all kinds, and to take over as a going concern the business now being conducted as Giles, Rice & Peters; capital $100,000.

Synder Bros., Limited, Waterloo, Ont., were recently incorporated to manufacture and deal in furniture of all kinds, and to take over as a going concern the business now carried on by Synder Bros. Upholstering Co., Limited, of Waterloo, Ont.; capital $600,000.

The Toronto Saw & Tool Co., Limited, were recently incorporated with a capital of $400.000., to manufacture and deal in saws and tools of all kinds. C. H. Kehoe and W. W. Fair, barristers-at-law, Toronto, are among the incorporators.

John Hanbury, the well-known sawmill operator of Vancouver, B. C. recently visited Brandon, Man., where he made arrangements for the reorganizing of his sash and door factory at Brandon, with a view to putting it in operation in the near future.

Victorian Case Company, Limited, Toronto, have been incorporated to manufacture and deal in furniture and fixtures and all kinds of wooden cases. Capital $40,000. Two of the incorporators are N. Philips and I. Finberg, solicitors, both of Toronto.

The Mutual Corporation, Limited, New Birks Building, Montreal, have commenced work on an extensive building programme calling for the erection of 1700 houses at a cost $6.000. each. A contract for a block of 100 buildings has been let to Anglin-Norcross, Limited.

The Everett Mfg. Co., Limited, Sault Ste Marie, Ont., are erecting a woodworking plant for the purpose of manufacturing such articles as ironing tables, clothes dryers, stepladders, long ladders, etc. Employment will be given to about six men at the start, and it is expected that this number will be rapidly increased.

The Canadian Billiard Table & Supply Co., Limited,, Toronto, were recently granted a provincial charter to manufacture and deal in billiard tables, bowling alleys, phonographs and all kinds of furniture fixtures and cabinet work. Capital $25,000. J. S. Lovell and R. Gowans, both of Toronto, are two of the incorporators.

Ellwood Wilson, manager of the Forestry Division of the Laurentide Co., Limited, in addressing the Engineering Institute of Canada, at Ottawa recently, intimated that a paper age was looming up on the horizon. Pulp and cardboard rugs, pulp and paper furniture, wall hangings, boxes, barrels and milk bottles, were all coming in the near future.

E. B. Salyerds, Preston, Ont., whose hockey stick and brush factory was recently destroyed by fire, has taken over the plant formerly occupied by the Canada Machinery Corporation, and will put in the equipment necessary to carry on the manufacture of his line. Mr. Salyerds has secured a lease of this building and will resume manufacturing operations at the earliest date possible.

The Canada Car & Fondary Co., Montreal and Amherst, has received a contract from the Canadian National Railways for repairing 1000 cars. Half of this work will be handled at the Amherst plant, while the balance will be undertaken by the Montreal branch. The amount involved is in the neighborhood of $1,000,000. It is anticipated that when these works are once re-opened and put into operation, enough work will be forthcoming to keep them going indefinitely.

Gem Crib & Cradle Co., Limited, Kitchener, Ont., have been incorporated to manufacture and deal in childrens furniture and childrens vehicles and to take over as a going concern the business known as the Gem Crib & Cradle Co., capital $40,000. F. C. Brandt

International Job Time Recorders

eliminate the non-productive minutes

These non-productive minutes, representing the difference between the purchased labor and the actual productive labor, are one of the largest factors that control your profits. They represent a dead loss that cannot be reclaimed.

Will your present system of time-keeping eliminate them? If not, you owe it to yourself and your business to investigate the system that will do it.

Hundreds of manufacturers have reduced the difference between their purchased labor and productive labor by the installation of International Time Recorders and International Job Time Recorder. The records which they give you are made by the workman himself, are printed and unchangeable and therefore promote confidence between employer and employee.

Let us tell you more about them—how they have been adopted by other manufacturers of wood products, and demonstrate their benefits to you.

Those manufacturers have proven the great saving from our machines. If they are "right" you, Mr. Non-User, must be "wrong" and it must be costing you a lot of money.

International Speed Accuracy Economy Business Machines

International Business Machines Co.

LIMITED

F. E. MUTTON, Vice-President and General Manager

Head Office and Factory: 300-350 Campbell Avenue, Toronto

HALIFAX, 44 Granville St. ST. JOHN, 29 Dock St. QUEBEC, 506 Merger Bldg MONTREAL, 1 and 3 Notre Dame St. OTTAWA, 190 Queen St. TORONTO, 409½ Yonge St. HAMILTON, Room 8, 36 James St. S. LONDON, 489 Richmond St. WALKERVILLE, 44 Lincoln Rd WINNIPEG, 227 McDermott Ave. VANCOUVER, 230 Cambie St. SASKATOON, 254 Third Ave. S.

Also manufacturers of International Dayton Scales and International Electric Tabulators

and W. Brandt, both of Kitchener, Ont., are two of the incorporators.

Alder & Karasinsky were recently registered in Montreal as cabinet makers.

Boulette & Son, Manigotagan, Man., have commenced work on an up-to-date planing mill.

R. Lathan, Ottawa, Ont., has taken over the carriage factory formerly operated by P. Armstrong.

T. Clements, manufacturer of toys, Toronto, has been succeeded by the Earlscourt Toy Works, Limited.

Wilson & Grier, Montreal, P. Q., were recently registered as pattern makers with John Wilson and J. F. Grier as partners.

Nelson Gilbert recently passed away at his home in Brockville. Mr. Gilbert was connected with the N. Gilbert Boat Co., Brockville, Ont.

The Eastern Billiard Table Co., Limited, Montreal, P. Q., were recently granted a charter to manufacture and deal in billiard and pool tables of all kinds.

The Sherlock-Manning Piano & Organ Co., London, Ont., report a decided improvement in the demand for pianos and expect shortly to be operating under normal conditions.

At a recent meeting of the shareholders of the Canada Factories, Limited, permission was given the contractors to dispose of the Brockville plant if the opportunity presented itself.

The Radford, Wright, Wilson Co., Limited, Winnipeg, Man., have been awarded contracts for the woodwork for a garage and a number of stores which are being erected in Winnipeg.

Col. A. W. R. Wilby, B. C. Agent for the Canadian Government Merchant Marine, recently announced that the Dominion Government had decided to continue the building of wooden ships at Victoria, B. C.

The Lindsay Pleasure Boat Co., Limited, 916 Powell St., Vancouver, B. C., recently commenced work on a boat factory. The new building is to be one-storey 25 x 100 feet and will cost in the neighborhood of $3,000.

H. A. Hamilton, of Hart, Hamilton & Jackson, Toronto, wholesale lumber dealers, has retired from the firm. The business will be conducted by Hart & Jackson at the same address, 702 Bank of Hamilton Bldg., Toronto.

American Bed and Spring Company, Limited Toronto, have been incorporated to manufacture and deal in beds and springs; capital $40,000. Two of the incorporators are M. Tarnowsky and A. Starkman, both of Toronto.

Hart & Lefeber, Limited, Montreal, recently opened an office at 38 Grey Nun St. They propose to deal in veneers and panels and will also act as distributors for "Casco" Waterproof Glue which is manufactured by the Casein Mfg. Co. of New York.

The Western Implements, Limited, Winnipeg, Man., were recently incorporated to manufacture and deal in agricultural implements of all kinds; capital $500,000. C. A. Andrews and H. Brown, both of Winnipeg, are among the incorporators.

Latour & Dupuis, Inc., St. Jean, P. Q., have commenced work on a new sash and door factory and planing mill which is to be completed by June 1st 1922. The new plant consists of a two-storey building 120 x 96, and is of concrete and brick construction.

The Doherty Piano Co., Clinton, Ont., was recently put on a capacity production basis. This factory is being operated with a full complement of hands and twelve hours a day The present output is greater than at any period since this plant has been in operation.

The Canadian Vatu Drying & Woodworking Co., Limited, Sault Ste Marie, Ont., have been incorporated to conduct a kiln-drying operation and to manufacture and deal in furniture, boxes and other wood products; capital $40,000. J. A. Craig and W. J. Hall are two of the incorporators.

John R. Little, Manigotagan, Man., is negotiating for a site on which to erect a box factory and lath mill. Arrangements have been made with Boulette & Son for a supply of timber, and it is anticipated that as soon as a suitable site has been secured, that work will be commenced on the plant.

A by-law is to be placed before the ratepayers of Regina, Sask., to extend the fire limits west so as to permit the Regina Sash & Door Co. to construct a new factory which has been under contemplation. The construction of this building has been held up for a long time pending a settlement of this question.

L. L. Brown, Toronto, B. C. Lumber Commissioner for Eastern Canada, together with his wife and family, returned recently from a trip to British Columbia. Mr. Brown spent a delightful holiday renewing old acquaintances and while on the Coast delivered a number of important addresses before various lumbermen's associations.

The International Wheel & Rim Co., Limited, Toronto, Ont., were recently incorporated to manufacture and deal in automobile wheels and rims for wheels; capital $50,000. Negotiations are under way for a site in Toronto, and in the meantime it is just possible that production will be undertaken in temporary manufacturing quarters. An office has been opened in the Lumsden Building, Toronto.

A deputation of five blind men waited on Hon.Dr. J. D. McLean, provincial secretary for B. C. to see if the government would assist them in establishing a broom factory. It is hoped in this way to find employment for about a dozen men similarly afflicted. The deputation was sympathetically received and assured that the government would conduct an investigation into the possibility of such a proposition paying. Without giving any definite assurance, the impression was left that the government would do all in their power to assist.

The Fish curing industry of Scotland, of which Aberdeen is the centre, offers a market for barrel staves that is worthy of the attention of Canadian cooperage stock manufacturers. Before the war about 2,500,000 barrels were required annually. These consisted chiefly of white spruce and were of Scandinavian manufacture. The staves for fish barrels must be both air-tight and water-tight and are usually sawn but not dressed. The pre-war price was about 77s per M feet, while to-day's price is about £7 per M, delivered at Aberdeen. Fuller information on this market may be secured from the Commercial Intelligence Branch of the Department of Trade & Commerce, Ottawa.

The Merritt Engineering & Sales Co., Lockport, N. Y., have issued a new catalogue covering the Merritt line of veneer-cutting and basket-making machinery. Among the equipment listed is to be found the Merritt veneer lathe; veneer clipper; dimension clippers, crate head tenoners for plywood

One Reason why Kraetzer Cured Gum is Straight and Flat

Ask Your Factory Superintendents

You don't have to take our word for it ask your factory superintendent.

What? Why, how much stained or doty gum you are getting and what it is costing in waste, expense of removing and replacing unsound pieces put into work in the hope of "getting by" and minimizing waste, only to have it fail to pass inspection.

Do you know what stain is? It is what a headache is to you. A headache is only a warning of some derangement of one or other of the organs. Stain in lumber is only the visual evidence that decomposition has started within. How long did you suffer and "cuss" with headaches until you heeded the warning and had your eyes fitted with glasses?

Remember how beautiful the world became all at once

In just that manner, your worries cease and problems of production become simple when you heed Nature's warning and use GUM that is BRIGHT.

Of course, you can get Gum in this condition - at least, you can from us. We guarantee our KRAETZER-CURED Gum to be FLAT, STRAIGHT, and BRIGHT. Know it by the brand.

Your Protection

THE KRAETZER-CURED LUMBER CO.

Our Guarantee

The Kraetzer-Cured Lumber Co.

GENERAL OFFICE: GREENWOOD, MISS.

Band Mills: Greenwood, Miss., Moorhead, Miss.

boxes; crate head cleat saws; bushel basket machines; knife grinders; hot plate redryers; hot plate hydraulic veneer presses.

Benson-Johnston, Limited, Hamilton, Ont., have been incorporated to manufacture and deal in office furniture and supplies; capital $500,000.

The factory and lumber yard of W. H. White, Ville St. Pierre, Que., has been completely destroyed by fire. The loss is $50,000, partially covered by insurance.

A good spindle guard not only reduces the chances of a workman cutting his fingers, it helps him do jobs with a surety that, if anything happens, his fingers will be safe.

Arnott & Sons, sash and door manufacturers, Vancouver, B. C., report that the local demand for their products is very strong and that they have all the orders they can handle.

The British Canadian Furniture Co., Limited, Vancouver, B. C., were recently registered as manufacturers of furniture, beds and bedding. The capital of this company is $200,000.

The Reo Motor Car Co. of Lansin, Mich., have secured a site and building at Walkerville, Ont., and plan establishing a plant for the assembling of their line of motor cars and trucks.

The H. A. Wood Mfg. Co., Belleville, Ont., has secured the Canadian rights for what are known as the "Alemite Products." Casters for furniture will be included among one of the lines to be manufactured in Canada.

It is reported that Dodge Bros., manufacturers of the well-known car bearing their name, have secured a site at Sandwich, Ont., and contemplate erecting a large plant to take care of both the Canadian and export trade.

Certain changes were recently made in the organization of the Sellers Kitchen Cabinet Co., Limited, Southamption, Ont. It is now being operated by the Durham Furniture Co. of Durham, Limited, under their own name.

The Da-Nite Furniture Co., Limited, Toronto, which was recently incorporated to manufacture furniture of all kinds, has been authorized by supplementary letters patent, to increase their capital from $200,000. to $1,000,000.

The exhibit of the North American Furniture Co., Limited, and the Owen Sound Chair Co., Limited, at the fall fair in Owen Sound was awarded the cup which represents the first prize for inside exhibits. The two companies made unusual preparations for this display and the decorations were of a most appropriate character. The feature of the showing was a complete dining room suite in Italian design, finished in antique Polychrome walnut.

Attractive Mahogany Desk

A very handsome desk was recently presented to the Toronto Board of Trade by the British Imperial Council of London, England. This was in appreciation of the way delegates from this council were entertained while in Canada last year. The desk itself is a very handsome piece of work. As will be noticed from the accompanying illustration, the predominant feature of the carving is the maple leaf. The inkstands are silver mounted and the inscription plate is also of silver. This desk was designed by C. G. Hare, of the firm of Bodley & Hare, London, W. C., and was made by A. W. Peacock, London, N. W. Needless to say, the members of the Toronto Board of Trade appreciate this attractive gift.

Canadian Hardwoods

Good Stocks
Right Grades
Prompt Shipments

:: Members National Hardwood Lumber Association ::

Crating
of all descriptions

C. A. Spencer, Limited
Merchants and Manufacturers
McGILL BUILDING - MONTREAL

Hardwoods

Some items on hand in our Toronto Yards for Immediate shipment

4/4″ To 16/4″

Ash	9870 ft.	Hickory	500 ft.
Basswood	49854 "	Maple, Birds-eye	1288 "
Beech	49085 "	Maple	36213 "
Birch	56697 "	Mahogany	12578 "
Chestnut	70813 "	Oak, Plain	62099 "
Cypress	29200 "	Oak, Qtd.	24445 "
Cherry	500 "	Poplar	46408 "
Elm	42657 "	Walnut	2753 "
Gum, Red	38089 "	Walnut, Circassian	3646 "
Gum, Sap	14494 "		

We can Kiln Dry your Transit Cars

Our Dry Kilns are operating night and day to full capacity, of about 250,000 ft. per month.

The Gall Lumber Co. Ltd.
ESTABLISHED 1875
Foot of Spadina Ave. TORONTO

"Hardwoods
are moving and good stock getting scarce. We still have some desirable items of

Ash
Basswood
Birch
Elm

Will be glad to quote on request"

Canadian General Lumber Company, Limited
712 Bank of Hamilton Bldg.
TORONTO
MONTREAL OFFICE: 203 McGill Bldg.

Selling
Graves, Bigwood & Co.'s
Lumber, Lath and Box Shooks

General Woodworking Trade Mart

Quick Action Section

Equipment Materials Employment

The Bankruptcy Act

SALE BY TENDER

In the matter of GEO. M. MASON, LIMITED, Authorized Assignor.

Pursant to the authority of the Inspectors of the above Estate, tenders are invited for the purchase of the following assets:

PARCEL 1. The Real Estate on the east side of Bayswater Ave., between Wellington and Somerset St., through to Breeze Hill Ave., in the City of Ottawa, consisting of 84000 square feet, more or less, together with all the buildings and plant thereon, including a large, fully equipped sash and door and general woodworking factory with sprinkler system steam and electric power, lumber storage sheds, railway siding, four frame houses &c.

PARCEL 2. The Real Estate adjacent to the above described parcel one, comprising a city block bounded by Bayswater Ave., Somerset St., Spadina Ave., and Wellington St., consisting of 56000 square feet, more or less, together with the buildings thereon used as Office and lumber storage sheds.

PARCEL 3. The Read Estate fronting on the Richmond Road in the district known as Woodroffe (a suburb of Ottawa) consisting of 54000 square feet, more or less, together with all the buildings thereon, including planing mill partially equipped, lumber storage sheds and office. Railway siding alongside.

PARCEL 4. The Real Estate, vacant, situate adjacent to the Bank St. Road and Village of Billings Bridge, a suburb of Ottawa, consisting of 57000 square feet, more or less, with tracks of C. P. Ry. running alongside

PARCEL 5. The Real Estate on the south west corner of Booth and Norman Sts., in the City of Ottawa, being 50 ft. x 50 ft. more or less, on which is erected a frame, part brick veneered, row of dwellings, known as Nos. 580-2-4-6 Booth St. This property is subject to a mortgage of $2500. at 7% which the purchaser may assume as part of the purchase price.

PARCEL 6. One Kelly motor truck, capacity said to be 2 tons.

PARCEL 7. One Kelly motor truck, capacity said to be 1½ tons.

Any of the above parcels may be inspected and further particulars received upon application at the office of the Trustee in the Jackson Building, Bank St., Ottawa.

Terms: Marked- check for ten per cent to accompany tender, which check will be returned if the tender is not accepted; forty percent in cash in thirty days from date of acceptance of tender and the balance in ninety days from said date, hearing interest at 7% per annum and secured to the satisfaction of the Trustee. These terms, excepting as to the deposit check, will not apply in the case of Parcels 6 and 7, which shall be cashed upon acceptance of tender.

Tenders for any one or more of the above Parcels will be received up to noon of Decemher 19th, 1921, addressed to the Trustee and marked "Tender re Estate of Geo. M. Mason, Limited."

The highest or any tender not necessarily accepted.

Dated at Ottawa, this 15th day of November, 1921.

GEO. A. WELCH, C.A.
Authorized Trustee.

For Sale

Three brand new modern 16 foot veneer saws with automatic set works and positive offset. The last word for veneer and thin lumber sawing. For particulars address Box 118 Candian Woodworker, Toronto. 11

GOOD VALUES

Subject to Prior Sale

These are only a few of our stock

Band Resaw, Connell & Dengler, 54 and 60".
Band Rip Saw, Fay & Egan No. 202 chain feed.
Belt Sander, Curtis No. 20.
Circular Saw Mill, Hoosier Pony.
Circular Resaw, 44 in. heavy type.
Dowel Machines, Hayes & Fay.
Dowell Gluer and Driver, E. B. Hayes.
Door Clamp, Hayes Standard Power.
Jointer, Falls Machine Co., undercut 24 in.,
Jointers, 18" and 24".
Lathe, Back Knife Clement 40 in.
Moulder, Hermance 8 and 10 in., 4 side.
Moulder, Woods 10 and 12 in. inside.
Moulder, American 10 in., 4 side.
Matcher, American No. 229-fast feed hardwood flooring.
Planer, 30 in. Fay &Egan Single Cabinet.
Buzz Planer, 16 and 24 in.
Sander, endless bed 48 in., H. B. Smith.
Sander, Moore Machine Co., belt.

Woodworking Machinery Company of Buffalo,
54 Mechanic St.,
Buffalo, N.Y.

FOR SALE

Box-Board Printer, 18 x 44 in. Connell & Dengler, Two Color, Chain Feed, $950.00.
Moulder, 4-side, 10 in. American, $700.00.
Double Cut-off Saw, Automatic, Berlin No. 229, $775.00.
Band Resaw, 54 in. Berlin, with 3 saws, $1,100.00.
Slab Resaw, Fischer Little Giant, $375.00.
Railway Cut-off saw, S. A. Woods, No. 190, $200.00.
Box Groover, Chase-Turbine, No. 245 Automatic, $300.00.
Nailing Machines, Morgan and Doig, all sizes.

Chas. N. Braun Machinery Co., Fort Wayne, Ind., U.S.A.

For Sale

Nearly new No. 162 Preston heavy high speed Shaper, with special jointing fences and safety hoods, ball bearing, L. P. Smith Brothers, 606 Jane St., West Toronto. 11

Canadian Steel Trade Conditions

Conditions in the steel trade of the Province of Ontario are said to be better than they have been for months, though a large part of the current business can be described as special. Industrial requirements are growing, however, and order sheets show that business of a diversified character is being placed. Structural business is coming along better; motor-car manufacturers are looking critically to their stocks; oil producers are seeking pipe. Several manufacturers who normally use liberal quantities of steel are starting operations again within the next few weeks; others have recommenced operations within the past fortnight. Inquiries for steel indicate that a somewhat more active production schedule is in view. Railway rolling stock requirements, Ontario Transportation Commission orders, etc., are swelling the tonnage that is being booked by the sales agencies. There is still considerable competition for business.

Most interesting results were secured through a questionnaire sent out by a producer of steel products to his customers. The line of goods in question has a fairly general consumption by Ontario industries. Some of the largest companies did not commit themselves when asked as to the business prospects for the spring and winter months. Of those replying, 60 per cent were optimistic, 40 per cent leaned toward pessimism. An impartial examination would lead to the conclusion that some of the executives painted the situation too black. The proportion of 60 to 40 is fairly illuminating, however, indicating how business men are thinking.

Speaking generally, the moderate-sized establishment seems to have most optimistic views, so far as the metal industry is concerned. That may be partially explained by the fact that current business is chiefly of small dimensions.

Sash and Door Factory

For Sale

Location—St. Gabriel de Brandon, Berthier County, Province of Quebec.

Modern factory building with complete machinery and equipment for manufacturing sash and doors, butter boxes, moulding, etc. Well-equipped sawmill operated by steam and electricity. Excellent storage, one dry room and a two storey residence. Property occupies 63,000 square feet adjoining yards of Canadian Pacific Railway.

For immediate sale this property is offered at half its value.

Write or wire for further details and appointment to view.

POIRIER & FRERES,
St. Gabriel de Brandon, Que.

A New Departure in Staves

For years shippers of fruits and vegetables and the many other commodities which have been shipped in the slack barrel have sought a barrel that they could rely upon for durability, neatness and correct measure, says a writer in Barrel and Box. For years coopers have endeavored to furnish such a barrel at a price that woud appeal to their customers as being fair, but the coopers have been handicapped on account of the great variation in the general run of slack cooperage stock; stock that has been of such quality and lack of uniformity as to practically prohibit the manufacture of barrels that were in conformity with standard regulations, and in too many instances the quality of the stock has even prohibited the manufacture of a real substantial barrel; there has been great wastage not only in useable stock, but furthermore coopers have felt the wrath of their customers because of the lack of quality and lack of uniformity in barrels furnished. One big result has been the loss of many customers, who have thought it necessary to use competitive containers because of the poor service rendered by barrels.

The Crozed Stave Corporation, of Grand Rapids, Mich., has for some time been manufacturing what is known as the crozed stave, which if the claims of the manufacturer are to be considered upon their merits, places in the hand of the cooper the great opportunity to furnish his customers with high-grade barrels, of standard size, correct content measurement, and a durability that guarantees 100 per cent. service, and to furnish such a barrel at a no greater cost than current barrel manufacturing cost, in fact at less cost. The cooper is further offered the means of again regaining the trade that has been lost to the barrel, because he can furnish barrels that meet consuming needs.

Crozed staves are comparatively a new departure in the slack barrel line. They are cut, crozed, chamfered and equalized all in one operation, eliminating the need of crozing and chamfering equipment in the hand cooper shop. When jointed they are ready for assembling into barrels.

The croze is cut clean and deep, insuring a perfect fit to the head, with always the proper distance between heads, and the staves being of uniform thickness at the heads, insure the safe use of machine-made wooden or metal hoops, and aperfectly tight fit of the heads. This is also true in the event that thin staves are produced in cutting staves, as enough residue is left on the back side of the stave at the heads to insure this uniform thickness.

The Crozed Stave Corporation has a very modern plant at Boyne City, Mich., with a capacity for thirty million staves annually, producing at present staves from live, Northern hardwood. It is the finest and only plant of its kind in the world; electrically driven throughout, with extra heavy type cutters manufactured by the Rochester Barrel Machine Works, of Rochester, N. Y. One of the features of the equipment is the especially designed dryer, wherein staves are dryed by the vacuum process. The staves come from the dryer with a moisture content of 10 to 15 per cent, and are bright and clean, free from mold, wrinkles, splits, etc., and with complete retention of the original circle. They are jointed direct from the dryer, after which they are carefully graded, packed and ready for shipment. In fact, within 60 hours from the time the bolts are wheeled into the steam tunnels the staves are ready for use.

Made in Canada.

The

Sidman

Lumber Curing Process

—IN—

Remodeled or new Wood, Brick or Concrete Buildings.

Automatic Heating and Ventilating Systems for Varnish Rooms.

Three-ply and Du-o-fold Army Duck Curtains.

Automatic Suction Systems, for returning all condensation **direct** to the boiler.

Reducing and Back Pressure Valves, Oil and Grease Extractors.

Cantilever Steam Traps and other Steam Specialties.

Active and Non-down Draught Vent Heads for all purposes.

Cleanable Screen Window and Panel Ventilators.

Roller Bearing **Channel** Iron Car Bunks and Transfer Cars.

Thermostats, Recording Gauges, and the Sidman **Special** Hygrometers.

For Description and Prices, write

The Sidmans of Canada

Heating and Ventilating Engineers
and **Lumber Curing Specialists.**

LONDON THE C.L.C.K. Reg. Trade Mark **ONTARIO**

Made in Canada.

Information and Inquiries

You are cordially invited to make use of this department

Wants Dimension Material

St. Thomas, Ont., Nov. 2nd, 1921.
Editor, "Canadian Woodworker",

You have been devoting considerable attention recently to the question of dimension material. We are in the market for basswood dimension in carload lots as follows:------

1 in. x 2 in. x 24 in. or multiples of 24 in.
1 in. x 3 in. x 13 in. or multiples of 13 in.
½ in. x 6 in. x 13 in. or multiples of 13 in.

This material should be dry and can be either rough or dressed to pattern. Will be pleased to give full particulars to anyone in a position to supply this stock.

Sincerely yours,
Canadian Woodenware Co

Information on Kiln Drying

Katevale, P. Q., October 17th 1921.
Editor, "Canadian Woodworker."

Can you tell me if it is possible to kiln dry and manufacture lumber without it first being air-dried? If hardwood were kiln-dried direct from the log and manufactured into flooring, would it be necessary to re-dry it again after it has been run through the sticker? Should material for interior trim be dried before or after sticking? We find that the stock curls badly when run after being dried. How can this be overcome?

Any information you may give on the above subject, will be appreciated.

Sincerely yours,
J. R. Spendlove.

Kiln drying has been developed to such a degree that it is not only practical to dry stock direct from the saw but the drying losses are less than if the material had been air-dried for a year or more and then run through the kiln. By using a modern type of dry kiln, in which the humidity and temperature are subject to rigid control, you can bring any kind of hardwood down to the desired degree of dryness with a minimum of loss. If your material has been dried before machining, and it should be thoroughly dry, there is no need of any further drying after the flooring has been run unless it is stored in a very damp place or has been exposed to rain or water. The same applies to interior trim. The hardwood can be dried as it comes from the log, then run into trim and used without any secondary drying.

You ask if the trim be dried before or after planing, making the suggestion that kiln-dried wood curls if planed afterwards. Wood that is thoroughly and evenly dried should not curl through subsequent manufacturing operations. If any curling takes place, it means one of three things,—first,—that the stock was not dried to the proper percentage of moisture content; second, that it was not dried evenly, that is, that the centre or some other section contains more moisture than the surface; third, that the stock has not been treated properly in the kiln, and as a result has become case-hardened. The latter trouble can be overcome to a certain extent by steaming both during the drying operation and just before the material is taken from the kiln.

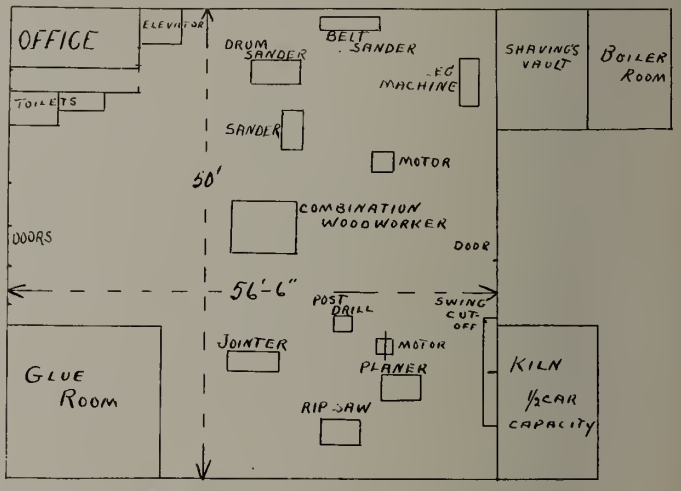
Layout of Furniture Factory

St. Helens, P. Q., November 4th 1921.
Editor, "Canadian Woodworker"

We are enclosing a rough sketch of a new factory we contemplate building, and would appreciate your opinion on the arrangement of equipment. What changes and improvements would you suggest, and why?

Sincerely yours,
H. L. N.

We are reproducing this sketch and would ask you to examine this carefully and send in what you consider to be an improved layout, giving the reasons



Suggested Layout for Furniture Factory

for any changes you may make. The arranging of machines presents many interesting problems, and the suggestions and experiences of other often come in very handy at a time like this. It will be interesting next month to compare the different layouts, which will be suggested by "Canadian Woodworker readers."

Book on Estimating

St. Catharines, Ont., Oct. 25th, 1921.
Editor, "Canadian Woodworker",

Will you kindly inform me where I could secure a book covering estimating for a sash and door factory and planing mill. What I have in mind is something that will give the quantity of lumber used in sash of various sizes, the number of bundles of lath for a room of given dimensions, and other information of a similar nature.

Sincerely yours,
H. I. L.

We do not know where a book of this kind is published; in fact we do not think there is such a book on the market. The Millwork Cost Bureau, 11 South La Salle St., Chicago, are bringing out a new course in which a considerable amount of attention is devoted to estimating. It might be a good idea for you to get in touch with this latter organization.

DARNELL-LOVE LUMBER COMPANY

MANUFACTURERS AND EXPORTERS

HARDWOOD LUMBER

LELAND, MISS.
U.S.A.

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R. W RICKETTS, TREASURER

CABLE ADDRESS
"DARLOVE"

TWO BAND MILLS

CODES USED
UNIVERSAL
A.B.C 5TH EDITION IMPROVED
WESTERN UNION

The following is a list of unsold lumber on our Yards, nearly all of which is dry and available for prompt shipment. We solicit your inquiries and orders.

QUARTERED WHITE OAK

Ft.	In.	
50,000	3/4	No. 1 C&S
15,000	4/4	No. 1 C&S. Strips 2½-5½ in.
60,000	3/4	No. 2 Com.

PLAIN WHITE OAK

50,000	5/8	No. 1 C&S
25,000	1/2	No. 2 Com.

PLAIN RED OAK

20,000	5/8	12&Wdr. Cof. Bds.
20,000	3/4	12&Wdr. Cof. Bds.
6,000	3/8	FAS
40,000	1/2	FAS
250,000	5/8	No. 2 Com.
300,000	5/8	No. 3 Com.
200,000	3/4	No. 3 Com.

ELM

18,000	12/4	No. 1 C&S
45,000	6/4	Log Run.
60,000	8/4	Log Run.
12,000	6/4	No. 2 Com.
15,000	10/4	No. 2 Com.
15,000	12/4	No. 2 Com.
75,000	5/8	No. 3 Com.
40,000	3/4	No. 3 Com.

CYPRESS

15,000	4/4	FAS
15,000	5/4	FAS
60,000	6/4	FAS
60,000	12/4	FAS
30,000	4/4	Sel.
30,000	6/4	Sel.
75,000	4/4	No. 1 Shop.
60,000	6/4	No. 1 Shop.
45,000	8/4	No. 1 Shop.
15,000	6/4	No. 1 Com.
15,000	8/4	No. 1 Com.
30,000	6/4	No. 2 Com.
30,000	4/4	Peck.
30,000	1x6	No. 1 Com.
60,000	1x6	No. 2 Com.
45,000	1x6	No. 1 Boxing.

COTTONWOOD

45,000	4/4	FAS 6-12 in.
45,000	4/4	No. 1 C&S

PLAIN RED GUM

30,000	3/8	No. 1 C&S
20,000	3/4	No. 1 C&S
30,000	4/4	No. 1 C&S

PLAIN SAP GUM

75,000	5/8	FAS 6-12 in.
20,000	3/4	FAS 6-12 in.
40,000	5/8	FAS 10-12 in.
40,000	5/8	FAS 13-17 in.
100,000	3/4	FAS 13-17 in.
30,000	4/4	FAS 18-21 in.
20,000	4/4	FAS 20 in. and up.
25,000	5/8	No. 1 C&S
150,000	3/4	No. 1 C&S
30,000	4/4	No. 1 C&S
20,000	5/8	No. 2 Com.
30,000	8/4	No. 2 Com.
20,000	5/8	No. 3 Com.

QUARTERED RED GUM

40,000	5/8	FAS
17,000	3/4	FAS
100,000	5/8	No. 1 C&S
200,000	3/4	No. 1 C&S
15,000	4/4	No. 1 C&S
30,000	5/4	No. 1 C&S
40,000	6/4	No. 1 C&S

QUARTERED RED GUM
(Sap No Defect)

60,000	5/8	FAS
60,000	3/4	FAS
50,000	4/4	FAS
40,000	6/4	FAS
75,000	8/4	FAS
75,000	5/8	No. 1 C&S
125,000	3/4	No. 1 C&S
50,000	4/4	No. 1 C&S
15,000	6/4	No. 1 C&S
15,000	8/4	No. 1 C&S

ASH

4,000	3/8	No. 1 C&S
3,000	5/4	No. 1 C&S
4,000	6/4	No. 1 C&S
12,000	12/4	No. 2 Com.
15,000	4/4	No. 3 Com.
7,000	12/4	No. 3 Com.

It is understood that our stocks are constantly changing by reason of manufacture and shipment. We are prepared to surface one or two sides.

Our Sales Representative in the Chicago and Michigan Territories is the

LELAND STAVE & LUMBER COMPANY

HOME OFFICE LELAND, MISSISSIPPI

MANUFACTURERS AND WHOLESALERS

LELAND, MISS.
U.S.A.

F T TURNER PRESIDENT
C E ROBBS, VICE PRESIDENT
F G WOODS, SECRETARY
H.D LOVE, TREASURER
W.F. LITTLE, GENERAL MANAGER

CHICAGO OFFICE
1039 MARQUETTE BUILDING
PHONE RANDOLPH 7957

C.W PARHAM, MANAGER

Defends Sound Wormy Chestnut

English Court Rules that Articles in which Sound Wormy Chestnut is Used are Prohibited from Entering British Market—Judgment Not Based on Facts

A British court recently handed down a judgment of $3,000 against a manufacturer of pianos on the ground that sound, wormy chestnut was used in the construction of the pianos in question. This, if allowed to stand, will result in a very serious situation, serious not only for the British manufacturer who uses chestnut as a base for his product, but for Canadian piano manufacturers and furniture men who cater to the British trade. The judgment is based on the ground that wood with the worm holes in it, or articles constructed of such wood, are liable to be infected with worms or larvae of injurious pests, and as such comes under a class of lumber, the import of which into Great Britain is prohibited.

J. M. Pritchard, secretary of the American Hardwood Manufacturers' Association, has taken exception to this ruling, and in an article in the association bulletin he shows that there is no foundation for the supposition that sound, wormy chestnut might contain infectious germs or larvae of any kind. The text of Mr. Pritchard's article is as follows:

Mr. Mayhew of the W. M. Ritter Lumber Co., has brought to our attention the fact that a British court has entered a judgment of $3,000.00 against a manufacturer of pianos on the grounds that wormy chestnut used as core wood in the manufacture of piano cases is liable to be infected with worms or injurious germs, which class of lumber is prohibited from importation to Great Britain, and the probabilities are the said piano manufacturer will be compelled to remove from England the piano cases in question, unless something may be done to bring about a repeal of this decision of the Brtish court.

Mr. Mayhew has secured several opinions as to whether or not wormy chestnut used as core stock contains any infectious germs and the unanimous opinion is that wormy chestnut does not contain any infectious germs or worms when used as core stock or base veneer, and that any worms or germs which might have been in the chestnut tree will be destroyed during the process of seasoning the lumber and the application of hot glue. All agree that wormy chestnut ranks as the very best hardwood for core stock and these opinions are upheld by Prof. T. E. Snyder, specialist in forest entomology, who is recognized by the Department of Agriculture as being an authorative expert in matters relating to insects affecting forest products.

The following are excerpts of Prof. Snyder's letters on this subject:

"Your letter of the 6th instant addressed to the Bureau of Entomology, has been referred to this office for attention. In reply, we beg to state that sound, wormy chestnut is much less liable to insect injury than ash, oak or hickory. In fact, we do not know of any authentic case where chestnut has been atacked by Lyctus powder post beetles after seasoning.

"The insects which infest living chestnut trees are different from Lyctus powder post beetles and are timber worms, namely a Lymexylon beetle technically known as Lymexylon sericeum Harris. You are perfectly right in stating that sound, wormy chestnut is not liable to be infected with worms.

"We take pleasure in enclosing our publication on Lyctus powder post beetles and their control. You will note that those insects work only in the seasoned sapwood of hardwoods and, as you know, chestnut does not have a very large amount of sapwood."

"Your letter of the 24th has been received and we take pleasure in giving you the following additional copies of our publication on powder post beetles.

"We believe that some wormy chestnut as a core or base for veneer is more suitable than any other hardwood which you could use, particularly as the sapwood of other hardwoods is infected by the very injurious insects described in the pamphlets sent you, whereas chestnut is never so attacked.

"As you know, sound, wormy chestnut is a trade name which has been in existence in the lumber markets for many years and applies to chestnut timber which contains holes made by timber worms while the tree is living in forest. These insects attack the living trees through knots or broken branches and make holes through the wood of the living trees. After the tree is cut and the wood dries out, these insects will not continue to work in the wood and, hence, the wood is graded as sound, wormy chestnut.

"We consider the utilization of sound, wormy chestnut a matter of conservation, since such wood can be used when covered by veneer, whereas it could not be utilized, on account of the worm holes for ordinary uses.

"You may be interested to learn that a very large percentage of all chestnut timber is affected by these worm holes—indeed, in some localities as high a percentage as 75, and there is no trade prejudice in the United States against the grade sound, wormy chestnut, since it is well realized cypress lumber is infected by disease.

"If there are any further details which we can give you, we shall be glad to do so.

"It seems to us that a strong point to emphasize in your appeal is that chestnut lumber is not infected by insects which are ordinarily destructive to other hardwood veneer and the core or base of hardwood veneer. This injury is fully discussed in the pamphlets sent you."

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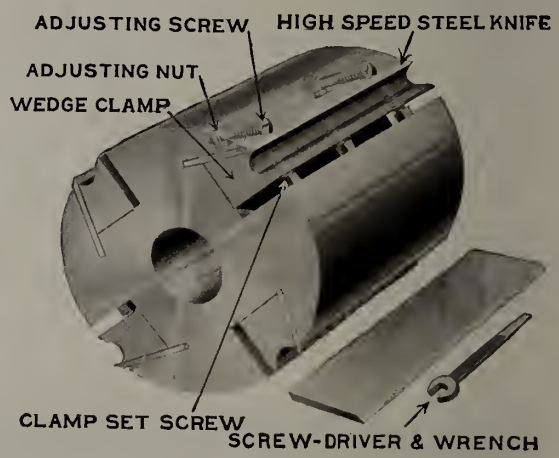

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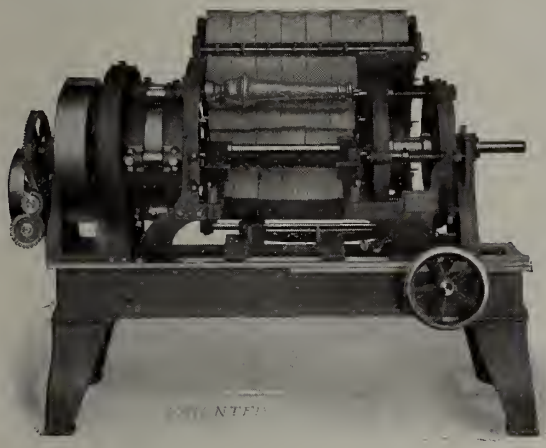

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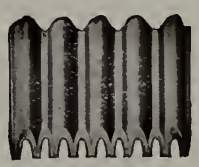

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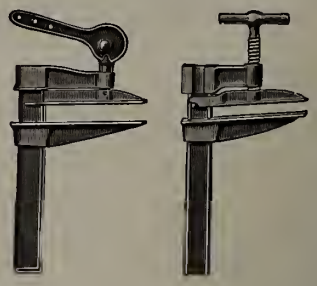

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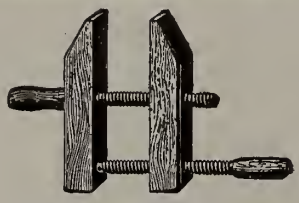

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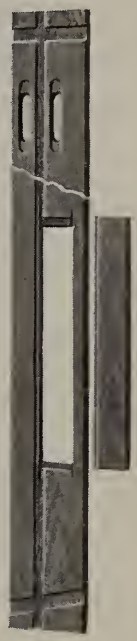

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Yates Machine Co., P. B., Hamilton, Ont.

FURNITURE LEATHER
Eagle-Ottawa Leather Co., Grand Haven, Mich.
Mechanical Leathers, Ltd., Toronto.

FURNITURE TRIMMINGS
Foster, Merriam Co., Meriden, Conn.

GARNET PAPER AND CLOTH
Carborundum Co., Niagara Falls, N.Y.
Macdonald, Norman, Toronto, Ont.
Oakey & Sons, Limited, John, London, S.E.I. (Wellington Emery & Black Lead Mills).

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TORONTO - - MONTREAL

"Canadian Woodworker" Buyers' Directory—Continued

GRAINING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GLUE
Coignet Chemical Products Co., New York N.Y.
Holloway, Randell & Co., Halifax N.S.
Perkins Glue Company, South Bend, Ind.
Sampson & White, London, England.

GLUE CLAMPS
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane, & Company, Kitchener.
Taylor Mfg. Co., Jas. L., Poughkeepsie, N.Y.

GLUE HEATERS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson. Cochrane. & Company, Kitchener.
Oliver Machinery Co., Grand Rapids, Mich.
Pringle, R. E. T., Toronto, Ont.

GLUE JOINTERS
Casey Co., M. E., Montreal, Que.
Jackson, Cochrane & Company, Kitchener, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GLUE SPREADERS
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener.

GLUE ROOM EQUIPMENT
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Company, W. R., Toronto, Ont.

GRINDERS (Cutter)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

GRINDERS (Knife)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Merritt Eng & Sales Co., Lockport, N.Y.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDERS (Tool)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GROOVERS
Atkins & Co., E. C., Hamilton, Ont.

GROOVING HEADS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Mattison Machine Works, Rockford, Ill.

GUM LUMBER
Aberdeen Lumber Co., Pittsburg, Pa.
American Hardwood Lumber Co., St. Louis, Mo.
Anderson-Tully Co., Memphis, Tenn.
Brown & Co., George C., Memphis, Tenn.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Colborn, C. B., Memphis, Tenn.
Darnell-Love Lumber Co., Leland, Miss.
Gum Lumber Association, Memphis, Tenn.
Hyde Lumber Company, South Bend, Ind.
Merceau-Hawkins Tie Co., Huntington, W.Va.
Paepcke-Leicht Lumber Co., Chicago, Ill.

HAND SCREWS
Fay & Egan Co., J. A., Cincinnati, Ohio.

HANDLE & SPOKE MACHINERY
Fay & Egan Co., J. A., Cincinnati, Ohio.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Whitney & Son, Baxter D., Winchendon, Mass

HARDWARE
Laidlaw Bale-Tie Co., Hamilton, Ont.

HARDWOOD DIMENSION STOCKS
Colborn, C. B., Memphis, Tenn.

HARDWOOD LUMBER
American Column & Lumber Co., Columbus, Ohio.
American Hardwood Lumber Co., St. Louis, Mo.
American Oak Mfrs.' Assn., Memphis, Tenn.
American Walnut Association, Washington, D.C.
Anderson-Miller Co., Toronto, Ont.
Anderson, Shreiner & Mawson, Toronto, Ont.
Anderson-Tully Co., Memphis, Tenn.
Arkla Lumber & Mfg. Co., St. Thomas.
Atlantic Lumber Company, Toronto, Ont.
Banning, Leland G., Cincinnati, Ohio.
Barr- Holaday Lumber Co., Greenfield, Ohio.
Barlett Lumber Co., W. C., Charleston, Va.
Bonner & Sons, J. H., Memphis, Tenn.
Brown Bros. Co., New York.
Brown & Company, Geo. C.
Bruce Co., E. L., Little Rock, Ark.
Burns & Knapp Lbr. Co., Conneautville, Ohio.
Bury & Company, Robert, Toronto, Ont.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Colborn, C. B., Memphis, Tenn.
Canadian General Lumber Co., Toronto, Ont.
Chicago Mill and Lumber Co., Chicago, Ill.
Darnell-Love Lumber Co., Leland, Miss.
Frye Lumber & Veneer Co., J. W., Dayton, O.
General Hardwood Lumber Co., Chicago, Ill.
Gulf Lumber & Trading Co., New Orleans, La
Heeney, Percy E., Kitchener, Ont.
Hyde Lumber Co., South Bend, Ind.
Kosse, Shoe & Schleyer Co., Cincinnati, O.
Kraetzer-Cured Lumber Co., Greenwood, Miss
Leach & Co., J. D., Chicago, Ill.
Liverpool Hardwood Co., New York.
London Lumber Co., London, Ont.
Long-Knight Mfg. Co., Indianapolis, Ind.
Luehrman Hardwood Lbr. Co., St. Louis, Mo.
May Hardwood Co., R. R. Louisville Ky.
McLean Mahogany & Cedar Co., Buffalo, N.Y.
McLennan Lumber Co., Montreal, Que.
Memphis Band Mill Co., Memphis, Tenn.
Mengel Co., Louisville, Ky.
Merceau-Hawkins Tie Co., Huntington, W.Va.
Mowbray & Robinson, Cincinnati, Ohio.
Murrelle Lumber Company, Memphis, Tenn.
Nichols & Cox Lumber Co., Grand Rapids, Mich.
Otis Mfg. Co., New Orleans, La.
Paepcke Leicht Lumber Co., Chicago, Ill.
Pedwell Hardwood Lumber Co., Toronto, Ont.
Peytona Lumber Co., Huntington, W. Va.
Pickrel Walnut Co., St. Louis, Mo.
Sawyer Goodman Co., Marinette, Wis.
Spencer, C. A., Montreal, Que.
Stark & Co., Jas. E., Memphis, Tenn.
Stimson Hardwood Co., J. V., Memphis, Tenn.
Stimson & Co., J. V., Owensboro, Ky.
Tennessee Lumber & Coal Co., Cincinnati Ohio.
Vail Cooperage Co., Fort Wayne, Ind.
Whiting Co., Wm. S., Johnson City, Tenn.
Wisconsin Lumber Co., Chicago, Ill.
Wayne Lumber Co., New York
Wood Mosaic Co., Louisville, Ky.
Yellow Poplar Lumber Co., Coal Grove, Ohio.

HYDRAULIC VENEER PRESSES
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Company, Wm. R., Toronto, Ont.

KNOBS
Waddell Mfg. Co., Grand Rapids, Mich.
Rowe Mfg. Co., Newaygo, Mich.

JOINTERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

KNIVES (Planer and others)
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

LATHES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochane & Company. Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie. H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

LEATHER (Artificial)
Fibro Mfg. Company, Beverly, N. J.
Mechanical Leathers, Ltd., Toronto.

LEATHER (Upholstery Grains)
Mechanical Leathers Limited, Toronto.

MACHINE KNIVES
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Peter Hay Knife Company, Galt, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont

MIRRORS
Chicago Mirror & Art Glass Co., Chicago, Ill.

MITRE SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.

MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich.
Walter & Sons, J. Kitchener, Ont.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A. Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

NAILS
Laidlaw Bale-Tie Co., Hamilton, Ont.

NAILING MACHINES
Morgan Machine Co., Rochester, N.Y.
Yates Machine Co., P.B. Hamilton, Ont.

OIL
Zero Oil Co., Parkersburg, Pa.

OIL STONE GRINDERS
Oliver Machinery Co., Grand Rapids, Mich.

PANELS
Algoma Panel Co., Algoma, Wis.
Calhoun Plywood Co., Sheboygan, Wis.
Hardwood Products Co., Nennah, Wis.
Hay & Co., Woodstock, Ont.

PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

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Waddell Mfg. Co., Grand Rapids, Mich.

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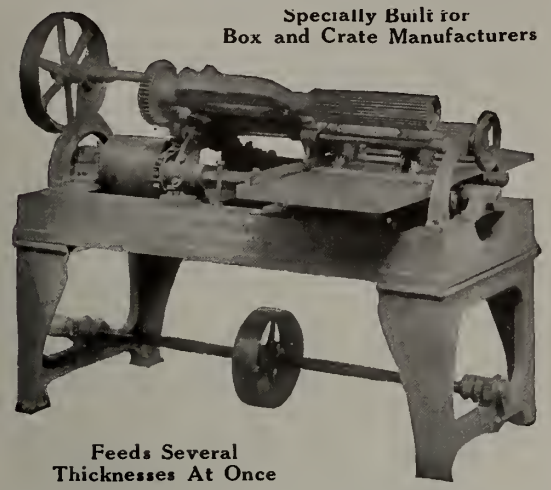

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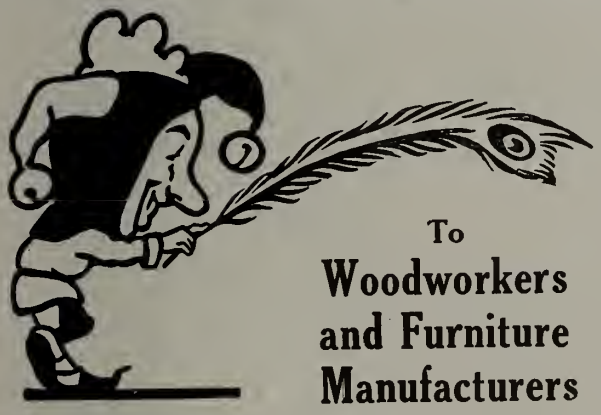
GARDNER, MASS.



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1—Jig Saw, Goldie McCulloch.
1—Jig Saw, McGregor Gourlay, Wood Top.
1—Double Disc Sander, American, 36″.
2—Hand Screw Veneer Presses, 38″—3 Screw American.
1—Gravity Swing Cut-off Saw, McGregor Gourlay.
1—12″ Moulder, Cowan & Co., 4-sided.
1—16″ Buzz Planer, Clark-Demill.
1—36″ Preston Band Saw.
1—28″ Band Saw.
1—7″ Moulder, Cowan & Co., 3-sided.
1—Sash Sticker, H. W. Petrie.
1—Double Surfacer, C.M.C., No. 212—30″.
1—Dowelling Machine, M31, Cowan & Co., No. 2, Cap. up to 2½″.
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1—Double Exhauster, 45″, American Blower Co.

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"Canadian Woodworker" Buyers' Directory—Continued

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Fay & Egan Co., J. A., Cincinnati, Ohio.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLANER BELTS
Mechanical Leathers Limited, Toronto.

PLANING MILL MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Mattison Machine Works, Rockford, Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLYWOOD
Calhoun Plywood Co., Sheboygan, Wis.

PRESSES (Veneer)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Jackson, Cochrane & Company, Kitchener, Ont.
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Co., Wm. R., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

REED
Carter & Co., E. T., Toronto, Ont.

REED MACHINERY
McKnight & Son Co., L. G., Gardner, Mass

RESAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

RIM AND FELLOE MACHINERY
Fay & Egan Co., J. A. Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Casey Co., M. E., Montreal, Que.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mackenzie Machinery Co., D., Guelph, Ont.
Mattison Machine Works, Rockford, Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

ROSETTES
Waddell Mfg. Co., Grand Rapids, Mich.

RUBBING MACHINES
DeVilbiss Mfg. Co., Toledo, Ohio.
Mattison Machine Works, Rockford, Ill.

SAFETY DEVICES
Cowan & Company, Galt, Ont.

SANDERS
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SASH, DOOR & BLIND MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SAWS
Atkins & Co., E. C., Hamilton, Ont.
Radcliff Saw Mfg. Company, Toronto, Ont.
Shurly-Dietrich, Ltd., Galt, Ont.
Simonds Canada Saw Co., Montreal, Que.

SAW SHARPENERS
Oliver Machinery Co., Grand Rapids, Mich.
Yates Machine Co., P.B. Hamilton, Ont.

SAW SWAGES
Atkins & Co., E. C., Hamilton, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.

SAW TABLES
Canada Machinery Corporation, Galt, Ont. ..
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SCRAPING MACHINES
Canada Machinery Corporation, Galt, Ont. ..
Garlock-Walker Machinery Co., Toronto, Ont.
Whitney & Sons, Baxter D., Winchendon, Mass.

SCREW DRIVING MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.
Reynolds Machine Co., Massillon Ohio.

SCROLL SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont. ..
Cowan & Company, Galt, Ont.
Jackson, Cochrane, & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamiltonfi Ont.

SECOND-HAND MACHINERY
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Woodworking Machinery Co. of Buffalo, Buffalo, N.Y.

SHAPERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Sons, Baxter D., Winchendon, Mass
Williams Machinery Co., A. R., Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont.

SHAVING COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

STAINS
Ault & Wiborg, Toronto, Ont.

SINGLE SPINDLE BOXING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

STAVE SAWS
Atkins & Co., E. C., Hamilton, Ont.

STAVE SAWING MACHINE
Whitney & Son, Baxter D., Winchendon, Mass

STEEL DOOR MATS
Cary Mfg. Company, Brooklyn, N.Y.

SURFACERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Yates Machine Co., P. B., Hamilton, Ont.

SWING SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE LEG LATHES
Fay & Egan Co., J. A., Cincinnati, Ohoa.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass
Yates Machine Co., P. B., Hamilton, Ont.

TABLE SLIDES
Walter & Company, B., Wabash, Ind.

TEMPERATURE REGULATORS
Canadian Powers Regulator Co., Toronto, Ont.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Compan, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Merritt Eng & Sales Co., Lockport, N.Y.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TIME CLOCKS
International Business Machines Co., Toronto, Ont.

TOPS
Calhoun Plywood Co., Sheboygan, Wis.

TRIMMERS
Arbuthnot Lumber Sash & Door Co., Vancouver, B.C.
Canada Machinery Corporation, Galt, Ont
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Pretson, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TRUCKS
National Dry Kiln Co., Indianapolis, Ind.
Oliver Machinery Co., Grand Rapids, Mich.
Shantz, P E., Preston, Ont.

TURNED WOOD GOODS
Canada Wood Specialty Co., Orillia, Ont.
Rowe Mfg. Co., Newaygo, Mich.
Walter & Sons, J. Kitchener, Ont.

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Doon Twines, Ltd., Kitchener, Ont.

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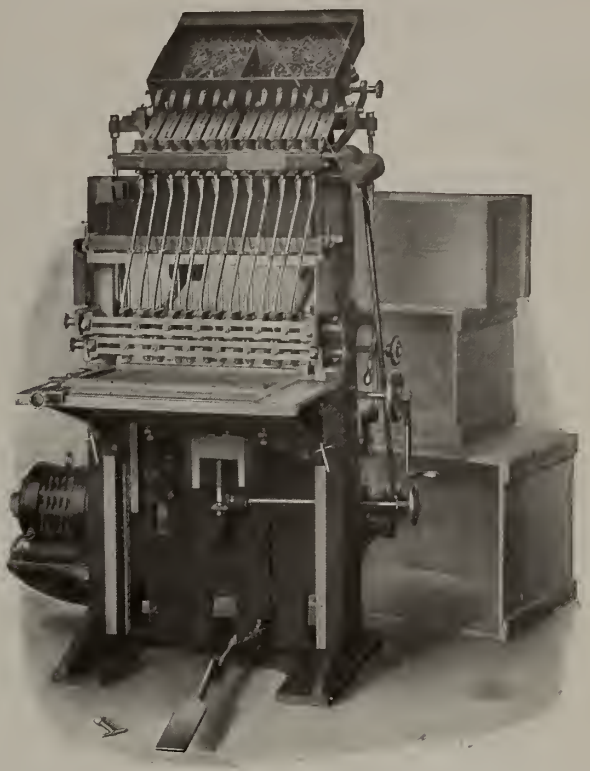

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Is it the right size

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"Canadian Woodworker" Buyers' Directory—Continued

VARNISHES
Ault & Wiborg Company, Toronto. Ont.
Penfound Varnish Co., Toronto, Ont.

VARNISH DRYERS
Nicholls Co.. A. S., New York, N.Y.

VARNISH SPRAYERS
DeVilbiss Mfg. Co., Toledo, Ohio.
Paasche Air Brush Company, Chicago, Ill.

VENEERS
Birds Eye Veneer Co., Escanaba, Mich.
Bury & Compny, Robert, Toronto, Ont.
Central Lumber Co., Indianapolis, Ind.
Curtis Co., C. E., Chicago
Freiberg Lumber Co., Cincinnati, Ohio
Frye Lumber & Veneer Co., J. W., Dayton, O.
Hartzell, Geo. W., Piqua, Ohio.
Hoffman Bros. Company, Fort Wayne, Ind.
Long-Knight Lumber Co., Indianapolis, Ind.
Litton Veneer Co., Rockford, Ill.
Memphis Veneer & Lumber Co., Memphis, Tenn.
Mowhawk Veneer Co., Warren, Pa.
Munising Woodenware Co., Munising, Mich.
Northwestern Cooperage & Lumber Co., Gladstone, Mich.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod-Jurden Co., Memphis, Tenn.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Veneer Co., New Albany, Ind.
Southern Veneer Mfg. Co., Louisville, Ky.
Standard Veneer Co., Portland Me.
Stimson Veneer & Lumber Co., Memphis, Tenn.
Talge Mahogany Co., Indianapolis, Ind.
Thompson & Co., Lewis, Philadelphia, Pa.
Toronto Veneer Company, Toronto, Ont.
Veneer Manufacturers Co., Chicago, Ill.
The Williamson Veneer Company, Mills—Baltimore, Md. Sales Branches, New York, N. Y., Chicago, Ill., Jamestown, N.Y., High Point. N.C.
Wood Mosaic Co., Louisville, Ky.

VENEER SAWS
Atkins & Co., E. C., Hamilton, Ont.

VENEER TAPE
Canadian Nashua Paper Co., Peterboro, Ont.
Gummed Products Co., Troy, Ohio.
Ideal Coated Paper Co., Brookfield, Mass.

VENTILATING APPARATUS
Canadian Blower & Forge Co., Kitchener, Ont.
Neville-Cooper Co., Toronto.

VENEER JOINTERS
Garlock-Walker Machinery Co., Toronto, Ont.

VENEER MACHINERY
Merritt Eng & Sales Co., Lockport, N.Y.
St. Joseph Iron Works, St. Joseph, Mich.

VENEER PRESSES (Hand and Power)
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company. Kitchener, Ont
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Company, Wm. R., Toronto, Ont.

VENEER LATHES
Merritt Eng & Sales Co., Lockport, N.Y.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WALNUT LUMBER
American Walnut Mfrs. Assn., Chicago.
Frye Lumber & Veneer Co., J. W., Dayton, Ohio.
Pickrel Walnut Company, St. Louis.
Purcell Walnut Lumber Co., Frank, Kansas City.

WINDOW FRAME MACHINE
Atlas Mfg. Co., Orlando, Florida.

WIRE
Laidlaw Bale-Tie Co.. Hamilton, Ont.

WIRE BOX STRAPPING
Cary Mfg. Company, Brooklyn, N.Y.

WOOD FINISHES
Ault & Wiborg, Toronto, Ont.
Penfound Varnish Co., Toronto, Ont.

WOODWORKING MACHINERY
General Machinery Co., Toronto, Ont.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

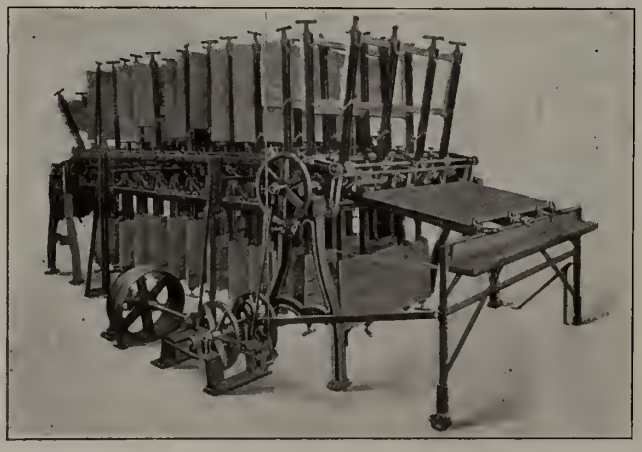
WOOD TURNING MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Yates Machine Co., P.B. Hamilton, Ont.

WORK BENCHES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOOD LATHES
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOODWORKING SPECIALTIES
Brantford Pattern Works, Brantford, Ont.

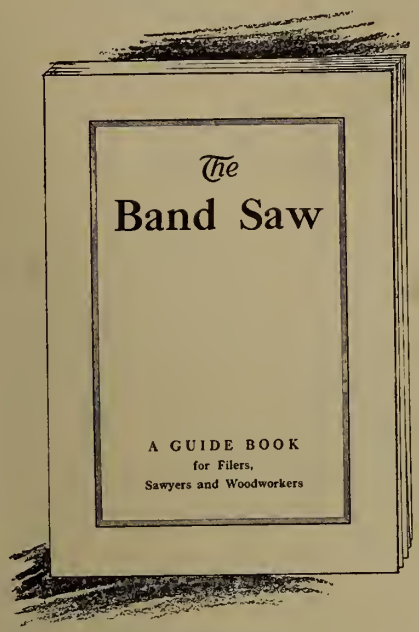
One Man Does the Work of Two
with a Billstrom Glue Clamp Carrier



For every plant where much edge-gluing is done there is a real need for a Billstrom.
Here's why:—

The empty clamp is held at just the right height for the greatest convenience of the workman.
When the clamp is filled he pulls a cord, which carries the filled clamp away and deposits an empty one in its place.
One man can accomplish as much by using it as two men can do employing the old methods.
It holds the work off the floor until the glue has set, when the glued stock can be quickly removed and piled flat, thus greatly conserving space.
It reduces the labor and cost of edge gluing to the minimum.
There is a sizs to suit your particular requirements.

N. J. BILLSTROM
2002 NINTH ST. ROCKFORD, ILL.



Ask For Your Copy

Into this book there has been put those general principles regarding the care of Band Saws, both Wide and Narrow, which we have found apply to the average mill or factory conditions. It is an invaluable instruction book for the apprentice learning to file saws. It is full of helpful suggestions for the expert who may want to know how others handle the various Band Saw problems.

For some time the makers of

Simonds Saws

have had this book in the course of preparation. It is now actually in type and the printer will have bound copies ready for distribution in a very few days. A copy of "The Band Saw" booklet will be mailed free to any interested millman who writes stating his name and address carefully and telling us his position or company connection. Address—Publicity Department, Simonds Canada Saw Co., Limited, Montreal, Que.

SIMONDS CANADA SAW CO., LTD.

Montreal, Que.

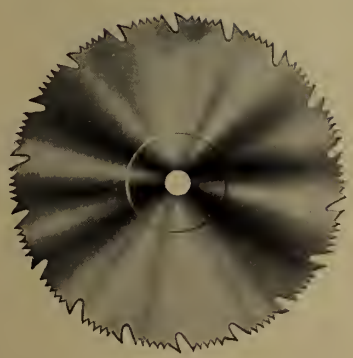
ATKINS

STERLING QUALITY

SAWS and KNIVES

mean continuous, efficient work and 100 per cent. production.

The extraordinary demand for more buildings and homes means that the Lumber output must increase.



Atkins Sterling Quality Saws and Knives will assist you in making the year 1921 the biggest and best in the history of your business.

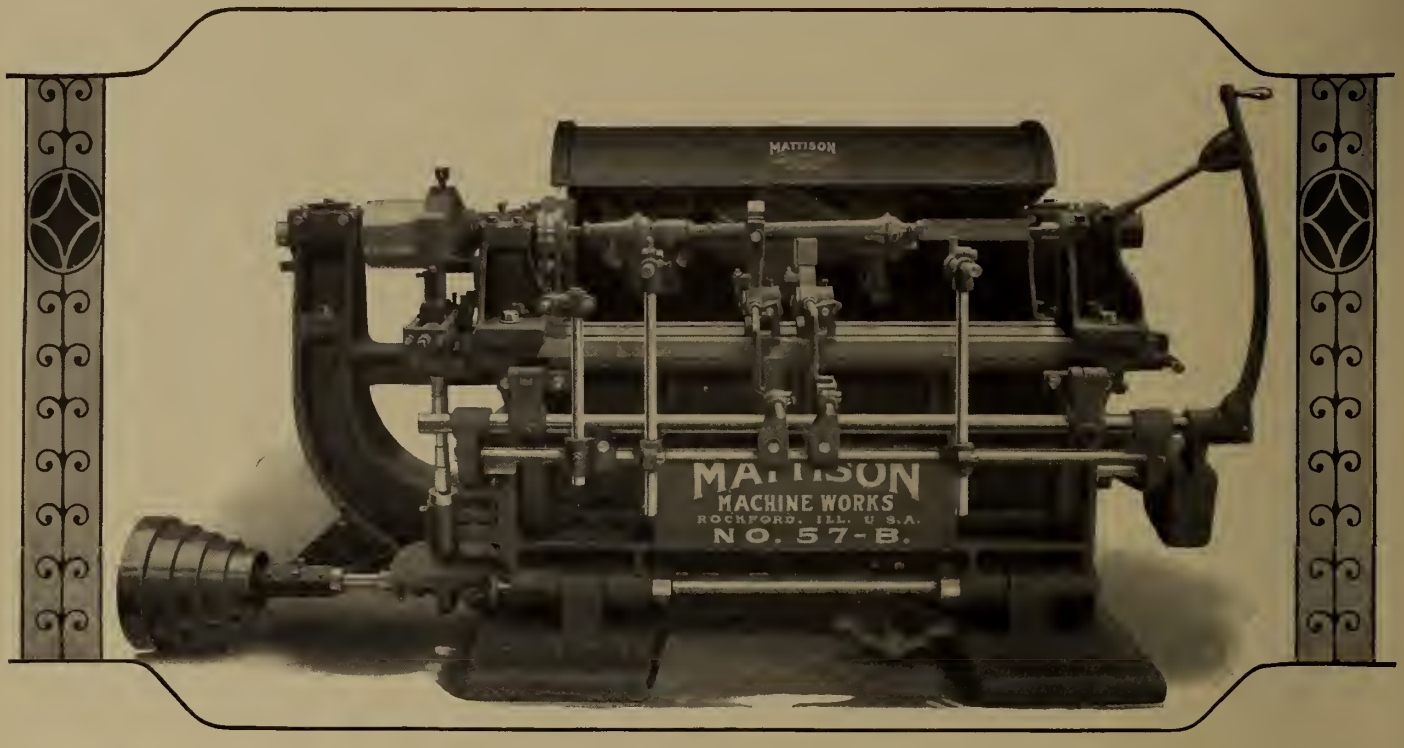
Write to-day for our Knife Booklet "C W" and Pattern Template Paper.

E. C. ATKINS & CO.

Makers of Sterling Saws

Factory—HAMILTON, Ont. **Vancouver Branch—109 Powell Street**

MATTISON
Automatic
The Standard Shaping Lathe
OVER 3000 IN USE



New Styles Demand More Turnings

The Mattison Automatic Shaping Lathe produces turnings much faster and cheaper than is possible with hand methods or with old style machine equipment. But of even greater importance is its flexibility which gives your designer free play in creating his designs. It faithfully reproduces all the historic round, square and octagon turned work, which plays so important a part in the new, distinctive patterns of today

If it is worth while to bring out new patterns, isn't it just as important to give equal consideration to the best and most economical method of producing those patterns?

MATTISON
MACHINE WORKS
Rockford, Illinois, U.S.A.

CANADIAN WOODWORKER and Furniture Manufacturer

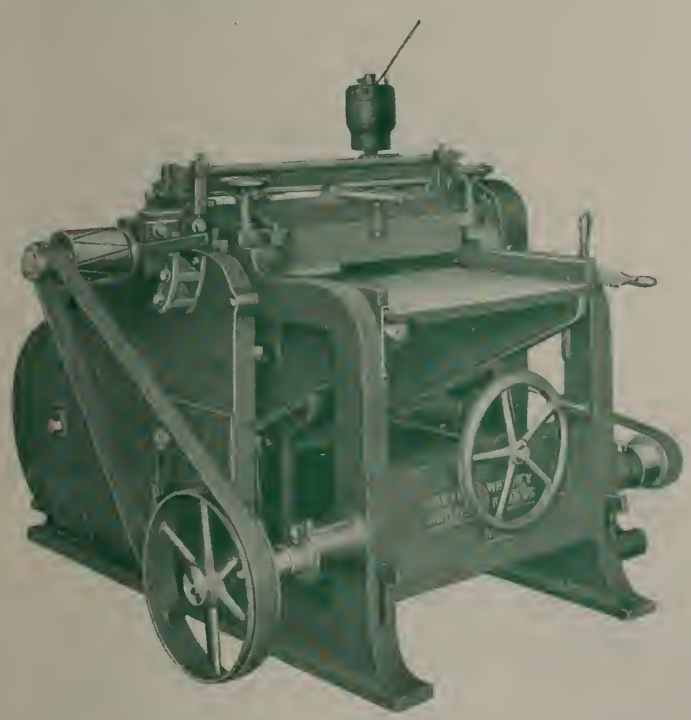
Volume Twenty-One | TORONTO, DECEMBER, 1921 | Number Twelve

THE WHITNEY

No. 32 Single Planer

with Round Cutter Head and Electric Grinder

has special features that appeal to every woodworker, such as the



30" No. 32 Single Planer—Round Cutter Head and Motor Grinder

RIGID FRAME with ample weight of metal.

BED raised and lowerd on Solid Wedges operating on wide tracks.

HARDENED CENTRE TABLE made extra thick.

AUTOMATIC CHIPBREAKER working concentric with the cutter head.

SIDE CLAMP CUTTER HEAD BOXES easily detached.

CUTTER HEAD with long bearings of large diameter.

REMOVABLE BABBITTED FEED SHAFT BOXES.

SECTIONAL FEED ROLLS to handle narrow and uneven stock.

MACHINE CUT GEARS.

Whitney Planers are equipped with motors coupled direct to the cutter heads when desired

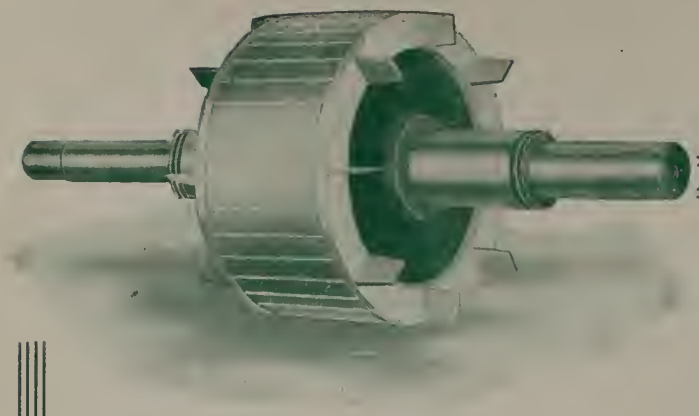
These machines can be furnished with two or four-knife Square Cutter Heads or four-knife Round Cutter Heads, Flexible or Sectional Chipbreaker and Motor-driven Grinders and Devices.

Write us for further information about this machine.

BAXTER D. WHITNEY & SON, Inc., Winchendon, Mass.

Canadian Representatives:

H. W. PETRIE, LIMITED TORONTO, ONTARIO



No Soldered Joints or Bolted Connections in

Canadian Crocker-Wheeler Rotors

The greatest improvement in modern induction motor design—no soldered joints to melt and cause arcing or open circuits and no bolted connections to work loose. The risk of fire as well as the possibility of motor troubles and consequent delay, is thus greatly reduced if not eliminated entirely.

The entire Rotor Winding of small squirrel-cage induction motors is cast of aluminum alloy—in one operation. Thus, the complete winding is one integral structure.

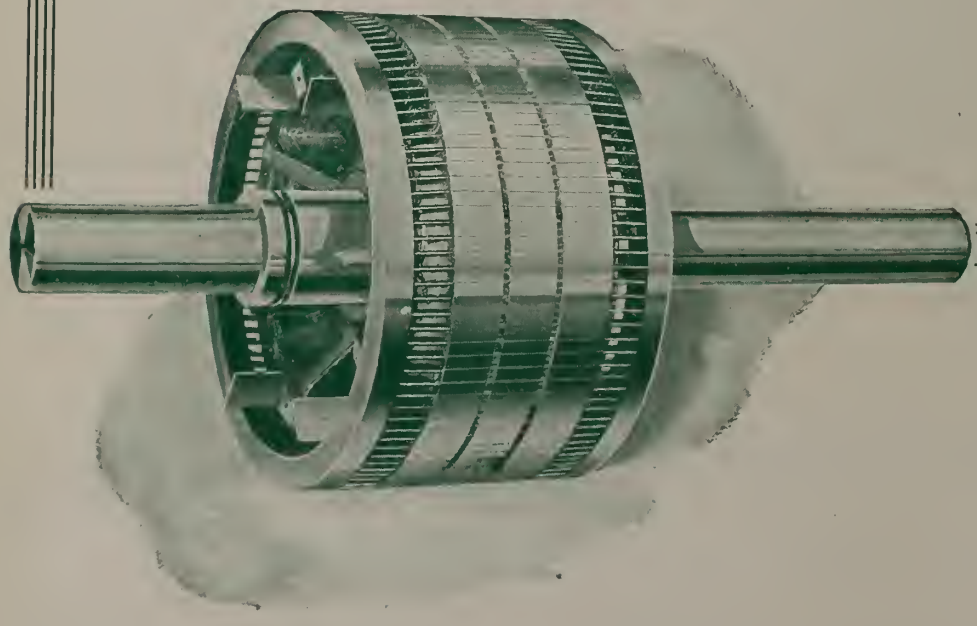
The medium and large size Rotors have liberal section copper bars and the end rings are cast-welded, making perfect contact.

The generous bearing sizes and sturdiness of mechanical construction throughout, further emphasizes the superiority of our motors for woodworking plants.

Northern Electric Company
LIMITED

Montreal	Quebec	Toronto		Windsor	Regina	Edmonton
Halifax	Ottawa	Hamilton	London	Winnipeg	Calgary	Vancouver

In Stock at our Branch Houses



PARTIAL LIST OF A 1 BARGAINS
IN WOODWORKING MACHINERY

Some new—others practically so—all at very attractive prices. We have many others
If you don't see what you need listed, ask us for particulars

1—Used Double Dowel Machine,
1—Used Bowmanville 4" Sash Sticker,
3—Used Machines for turning Mouldings,
1—Used Cowan Door Relisher
1—Used McGregor-Gourlay Door Clamp,
1—Used Sturtevant 36" Single Fan
1—Used " 45" Double Fan
1—Used " 48" Single Fan
7—Used Bowser Tanks,
1—Used Double Spindle Boring Machine,
1—Used Kelley Router,
1—Machinery Co. of American 5' Back Gauge,
1—Used American No. 2½ Tenoner,
1—Used Ballantine, Two Spindle Shaper,
1—Used C.M.C. No. 438 Arm Sander,
1—Used C.M.C. No. 507 Power Chisel Mortiser,
1—Used Preston 36" Band Saw.
1—Used Preston No. 127 Variety Saw Bench,
1—Used Preston No. 121 Pony Planer, 24"
1—New American No2. Disc and Spindle Sander,
1—Used Oliver No. 8 Wood Trimmer,
1— " Cowan 13" Four Side Moulder,
1— " Cowan M-277 32" Automatic Knife Grinder,
1— " Single Spindle Vertical Boring Machine
1— " Post Borer,
1— " Jackson-Cochrane Power Feed Rip Saw,
1—New American No. 30 Universal Saw Bench,
1— " " No. 25 Edging and Ripping Saw,
1— " " No. 3 Double Cut-off Saw,
2—Used American No. 229 9" Hardwood Planer and Matchers
1—Used American No. 22 Four Side Moulder,
1— " Hespeler, 10" Four Side Moulder,
1— " Houston 8" Four Side Moulder,
1— " American No. 2 Hand Feed Rip Saw,
1— " American 36" Double Disc Sander,
1— " Berlin 36" Three Drum Sander,

1—Used American 24" Jointer with power feed attachment.
1— " Dodds 10 Spindle Dovetailer,
1— " Reynolds Screw Driver,
1— " Covel No. 40 Automatic Saw Sharpener,
1— " Cowan 10" Four Side Moulder,
1— " Francis 24" Glue Spreader,
1— " Jackson-Cochrane Chair Seat Former,
1— " Four Spindle Horizontal Boring Machine,
1— " Knob Turner,
4— " Embossing Machines for mouldings
1— " Goldie-McCulloch Two Spindle Shaper
1— " Goldie-McCulloch Dowel Sticker,
1— " Revolving Bed Planer, 24"
1— " Cant-Laidlaw 8" Four Side Moulder,
1— " Cant-Gourlay 8" Four Side Moulder
1— " McGregor-Gourlay Small Self-feed Rip Saw
1— " Crescent Small Rope Moulding Machine
1— " Arm Sander,
1— " Goldie-McCulloch Single End Tenoner,
1— " Cameron & Co. Single End Tenoner,
1— " Cowan Horizontal Chisel Mortiser,
1— " Jenkins Veneer Jointer,
1— " Preston Veneer Taping Machine,
3— " Veneer Lathes, 130", 88", 54",
Swing Cut-off Saws,
Veneer Clippers,
1— " Beach Double Cut-off Saw,
1— " Box Ripping Saw Table,
1— " Elliot No. 5 Woodworker,
1x— " Merritt Re-driers,
Vegetable Glue Mixers,
Hydraulic Press,
1— " 54" Band Resaw
1— " Yates 49" Endless Bed Planer
1— " Roller Table Belt Sander
1— " Yates Double Cut-off Saw
" Variety Saw Tables,
" Universal Saw Tables and many others.

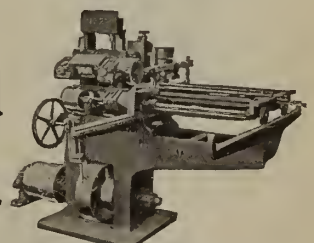
American No. 25 Power Feed Edging and Ripping Saw

Garlock Machinery Co. Limited

163 Dufferin Street

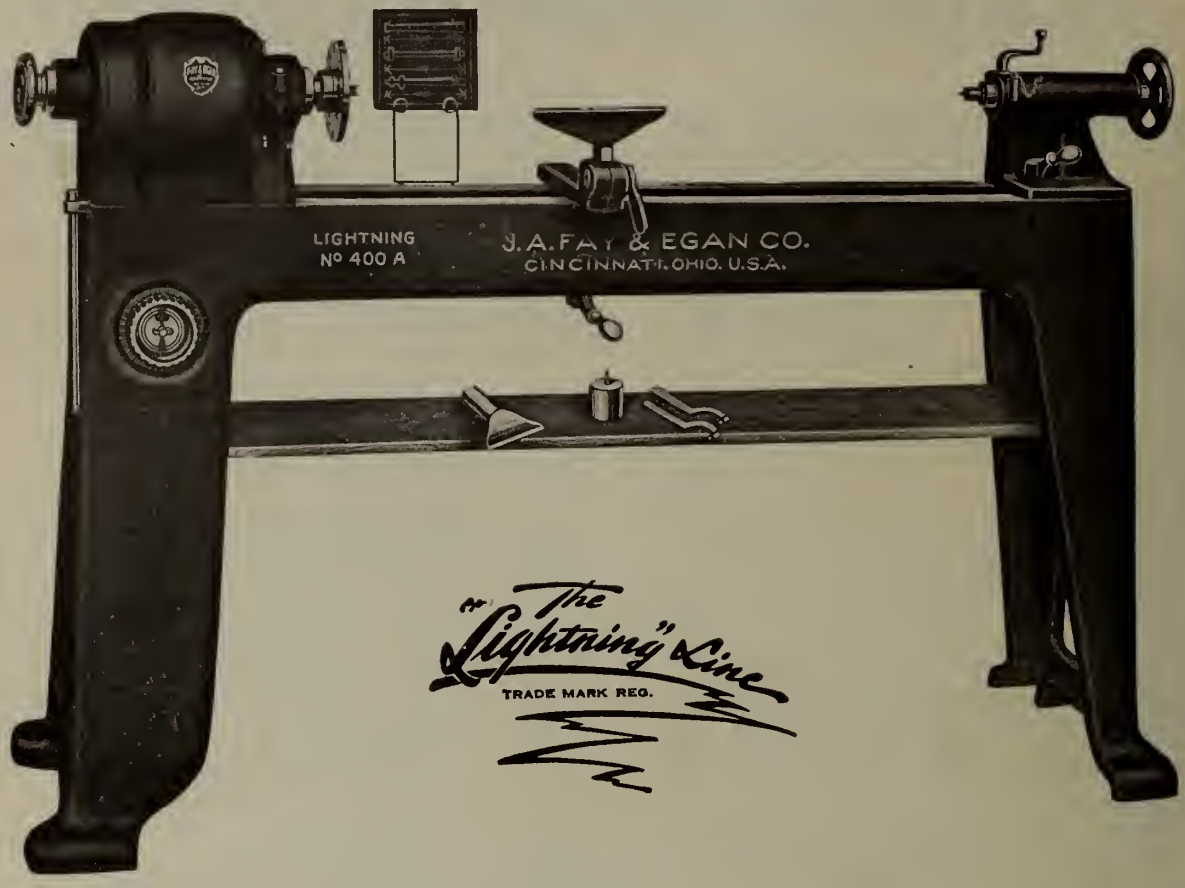
WINNIPEG TORONTO MONTREAL

Everything in Woodworking and Metal Working Machinery



American No. 2½ Single End Tenoning Machine

For the Shop as Well as the School



No. 400 "Lightning" Manual Training Lathes

While these Lathes are used by a large majority of Manual Training Schools for a variety of work, they are also used by the large manufacturing companies, such as the Goodyear Rubber Co., Willys-Overland Co., Delco, Dayton-Wright Airplanes, and the Cramp Ship Building Co.

They are 300 to 500 pounds heavier than any other Manual Training Lathe.

Variable speed Motor Head Stock can be furnished for either direct or alternating current.

Control apparatus is built in and all operating mechanism entirely enclosed.

Write today for Bulletin U-14 describing these wonderful tools in detail.

J. A. Fay & Egan Company

Established 1830

World's Oldest and Largest Manufacturers of Woodworking Machinery

153-173 W. Front St., CINCINNATI, OHIO

A Few More of the Smaller Ones

No. 257 Self Feed Rip Saw

No. 226 Saw Table

No. 199 Buzz Planer.

No. 235 Swing Saw

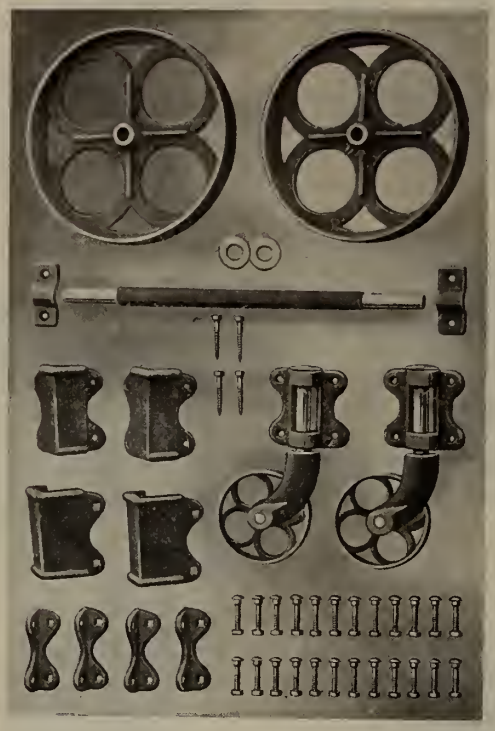
Here's a few more of the small ones we make. The same careful workmanship and best material is embodied in these machines as there is in the heavier types. We'd like to acquaint you with the different types of small machines we make and would gladly send you any information or circulars you request.

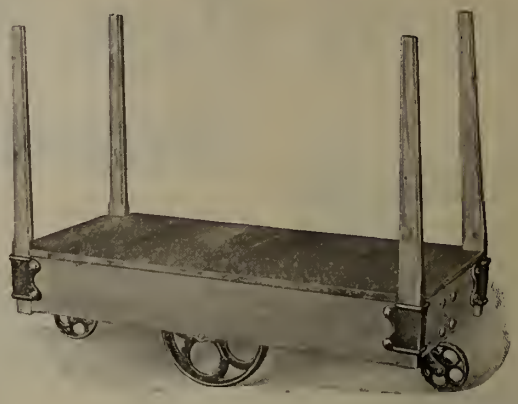
Drop us a line

No. 52 Scroll Saw

P. B. Yates Machine Co. Limited

Hamilton - Canada





Factory Truck Metal Parts

You can purchase Metal Parts for Factory Trucks at the price of castings—the same as truck manufacturers. Save also on freight and lumber. Detailed Blue Print of wood parts to complete trucks furnished with every order.

Oliver Machinery Co.
Grand Rapids, Mich. U. S. A.

No. 826 26 inch
Open Back Nailing Machine with Side Arm

YATES

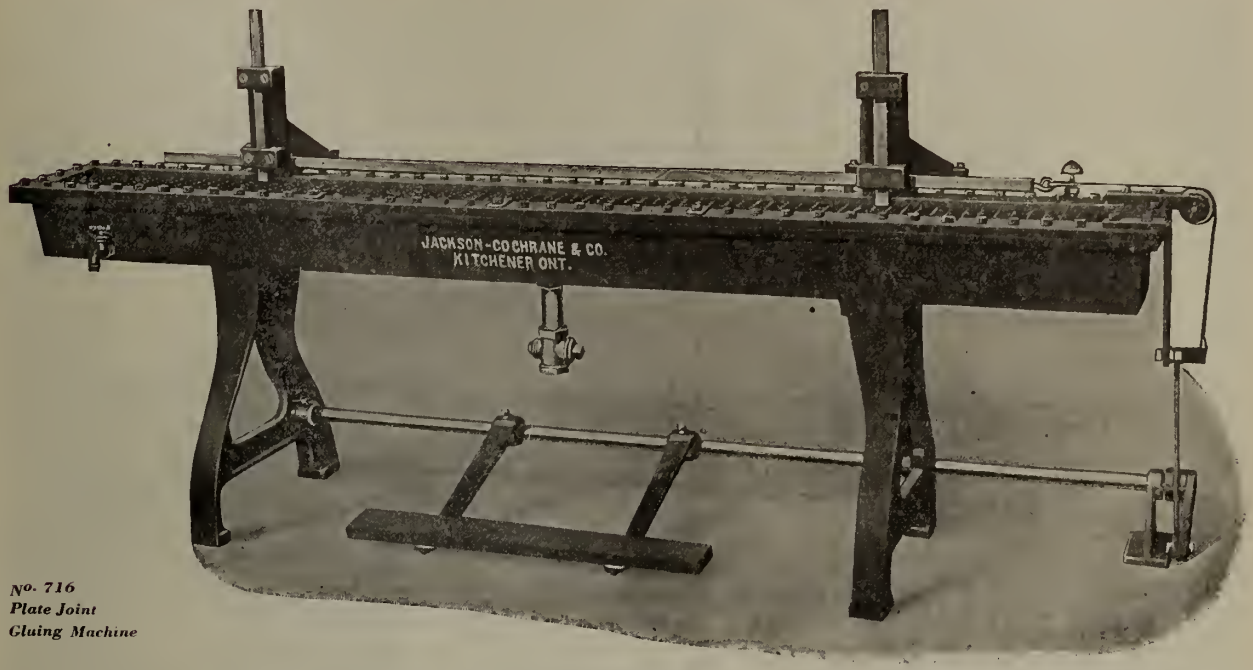
NAILING MACHINES
WITH SIDE ARM

With the Side Arm attachment on a Nailing Machine it is possible to nail together at the same time, side and end of boxes or crates. This is a time saver, but only one of the many advantages of a Nailing Machine.

Let's tell you more about these machines and their possibilities. Drop us a line it will not obligate you in any way.

P. B. Yates Machine Co. Ltd.
Hamilton - Canada

A NEW PLATE JOINT GLUE SPREADER



No. 716
Plate Joint
Gluing Machine

YOU CAN DOUBLE THE PRODUCTION OF YOUR GLUE CLAMPS WITH THIS NEW MACHINE

A thoroughly tested and tried machine that operates easily without waste or mess. It will more than double the production of your clamping equipment. This was proven when it was recently given a thorough trial in one of the largest furniture factories in the Dominion.

The method of operation is simple. The operator presses the foot lever down, forcing the perforated plate up out of the glue. Then by resting the edges of the stock on the plate and moving them backward or forward about one inch, the edges resting on the plate will be instantly and completely spread with glue. On releasing the foot lever the plate is lowered into the glue ready for the next batch of stock.

The tank is 5″ wide and 5″ deep.
Perforated plate is 4″ wide, ⅜″ thick and 1″ shorter than tank.

Size	Floor Space	Weight
5′ 11″	7′x2′	700
7′ 11″	9′x2′	800

Descriptive Circular sent on request

JACKSON, COCHRANE & CO., KITCHENER, ONT.

Have You Installed a Reynolds Machine Yet?

The old method of driving screws by hand is out of date and unprofitable. Present day conditions demand the elimination of all Magazine Fed Screw Driving Machine is one unnecessary labor costs and the Reynolds of the surest means of doing it.

We have an interesting booklet containing full details, which we shall be pleased to send you. Why not write us today?

Send us dimensions over all of your work and gauge and length of screws driven so that we can determine the proper size and type machine to meet your requirements.

The Reynolds Machine Co.

Department C.

Massillon, Ohio, U.S.A.

Drives machine screws wood screws, stove bolts, hex. head or square head bolts, or most anything that can be magazined.

CROSS-CUT MITRE & RIP SAW

AN accurate rapid and easily operated machine of wonderful value on light work and embodying all the requirements and attachments for general work.

Tilting table or boring attachment may be added at any time.

Our pamphlet describing the various features is yours for the asking. Send for it today.

D. McKenzie Machinery Co.

GUELPH ONTARIO

Prices and Full Details on Request

DOING the work on a C.M.C. No. 611 Heavy Ripping and Jointing Saw formerly done by three men and three boys in one of the largest Furniture Factories in Canada.

Doing it in comfort and safety and saving a man's wages in stock every day.

WRITE US FOR BULLETIN

CANADA MACHINERY CORPORATION, GALT, ONTARIO
LIMITED

Toronto Sales Office - - 721 Bank of Hamilton Building

"A Good Name is Better Than Great Riches"

We take this opportunity of wishing you all the compliments of the Season

"PROFIT" IS NOT the idea of FIRST IMPORTANCE in our building machinery. "SERVICE AND SATISFACTION TO THE CUSTOMER" IS the idea of FIRST IMPORTANCE, and to assure this, it is necessary that we

Give the Best We Have AND Put the Best We've Got

INTO

Our Work:—Your Machines.

OUR REWARD—

Slowly but Surely we are getting the reputation about the country of being **a dependable firm,** supplying only **the very best** and **the most reliable** woodworking machinery and standing behind it "for better or for worse."

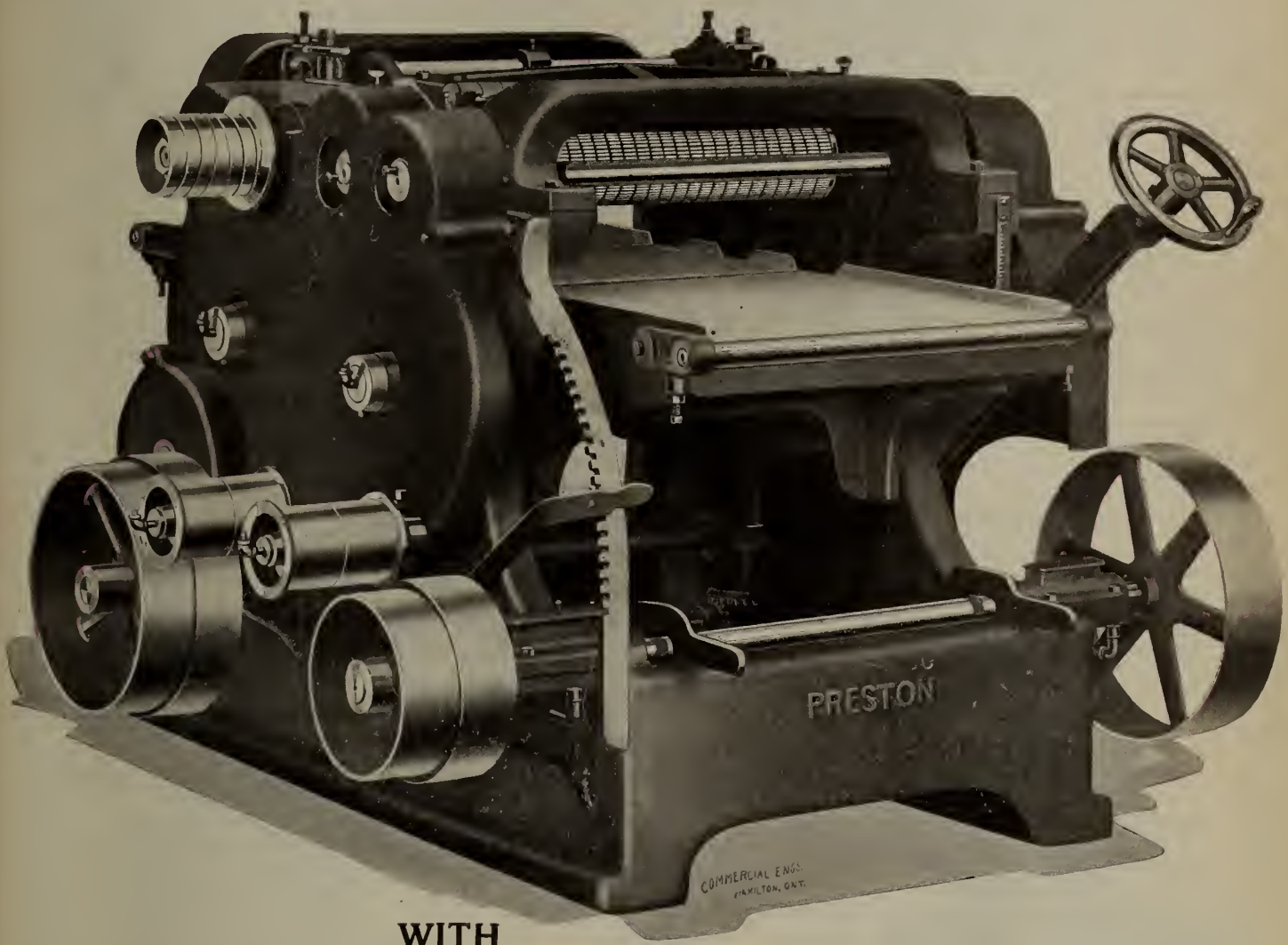
If you know any good about us, **tell your friends,** and if you don't know anything about us, **ask your friends,** but be sure to talk about us, and——give us a chance when next you need anything in our line **WELL DONE.**

The Preston Woodworking

PRESTON,

We are Sole Manufacturers and Agents in Canada of the Eaglesfield Patented Beltless Swing Saw.

Introducing a New High Speed Ball Bearing Surface Planer



WITH

(1) Specially selected S.K.F. Ball Bearings (2) Sectional Roll and Sectional Chipbreaker (3) Round Cylinder with 4 High Speed Knives (4) Stockbridge Knife Grinder and Jointer (5) Cylinder Speed, 5000 r.p.m.

The above is a cut of one of our No. 123-30" single surface Planers recently shipped a customer. We have supplied a number of them within the last two years, equipped exactly as above and would gladly show you the machines in operation in the different plants where sold. Speeded up, as this machine was, to 5000 R.P.M.(or to suit a customer's requirements) there is no question but what production and the quality of the work in any Plant will be greatly improved. It also raises the grade of your stock. Lumber run through our machine can be graded much higher than if run through a slower speed babbitt bearing machine. The machine can be used either as a roughing or a smoothing planer and will give 100% satisfaction.

Machinery Company, Ltd.

ONTARIO

Specialists in Ball Bearing Woodworking Machinery

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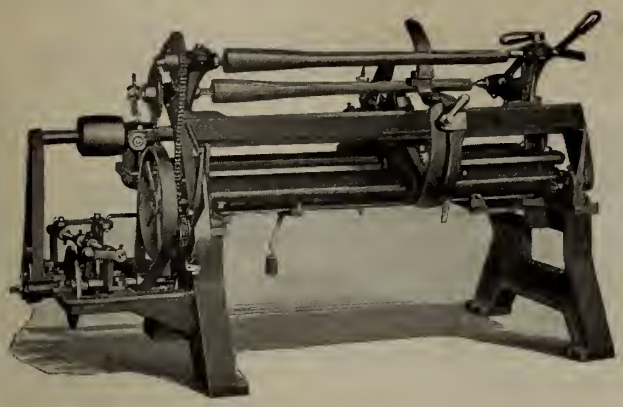

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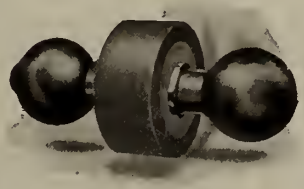

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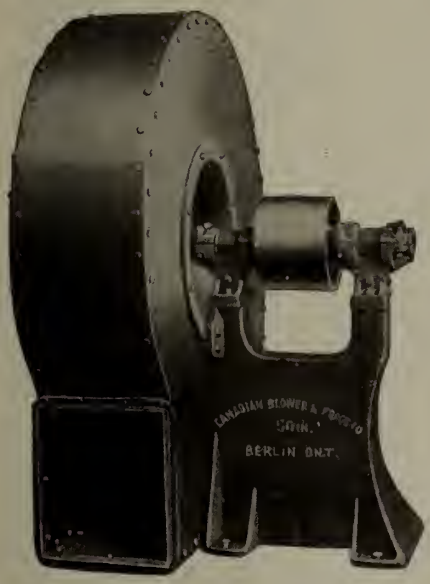

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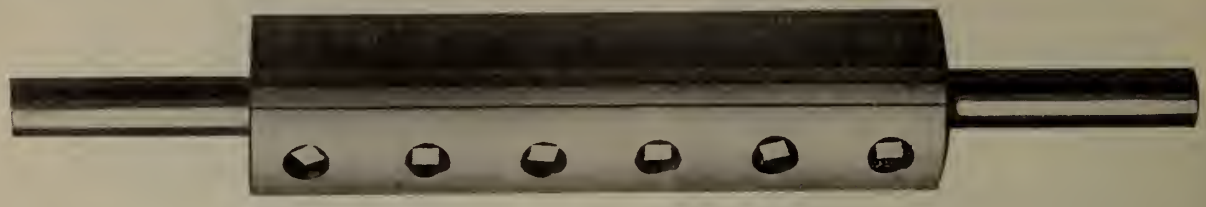

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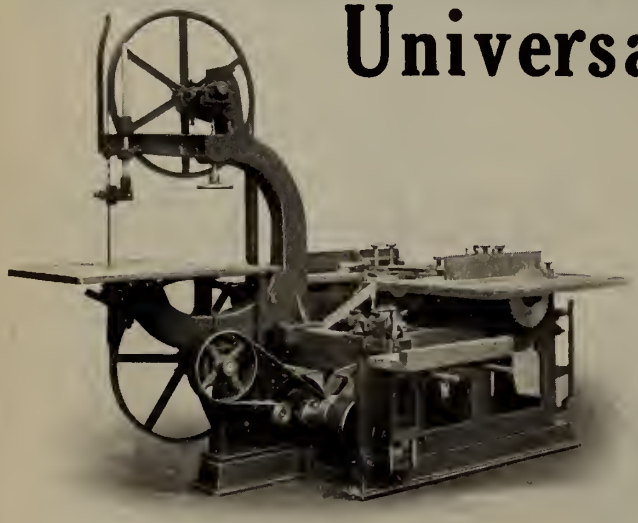

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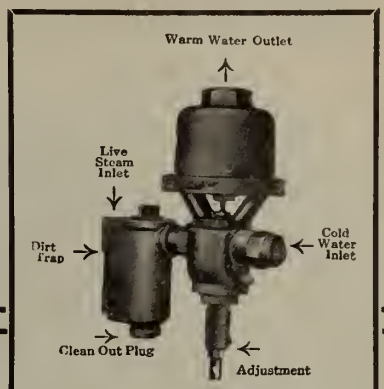

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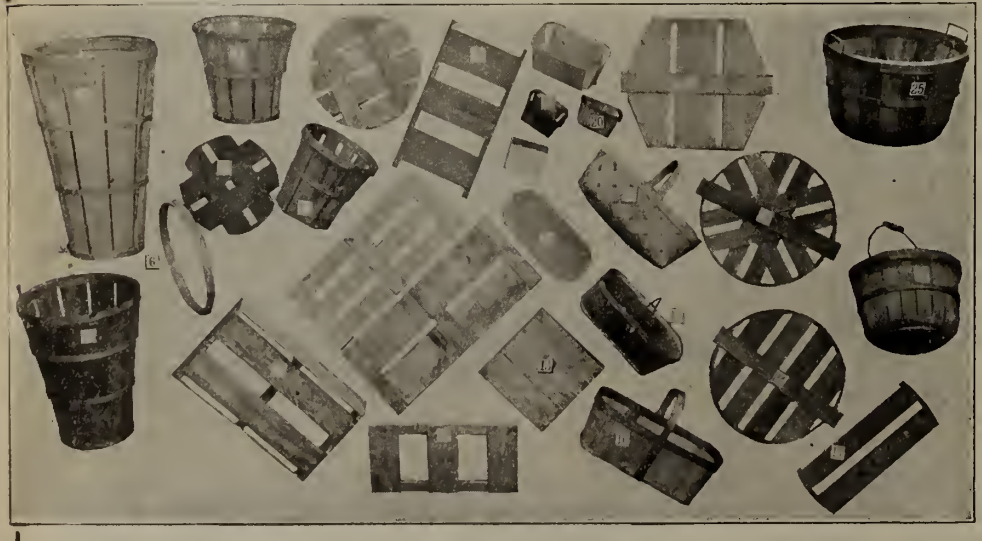

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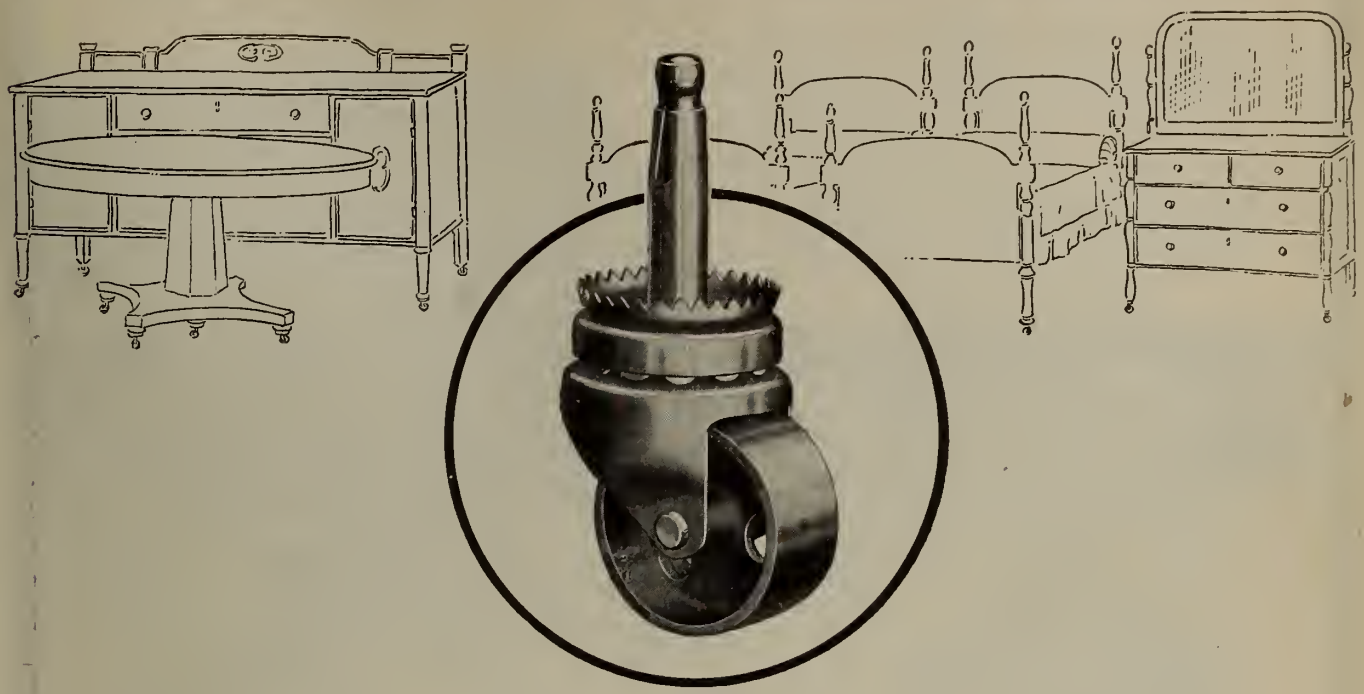

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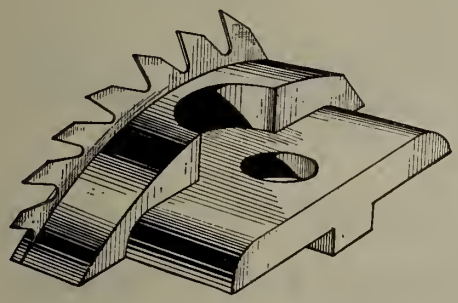

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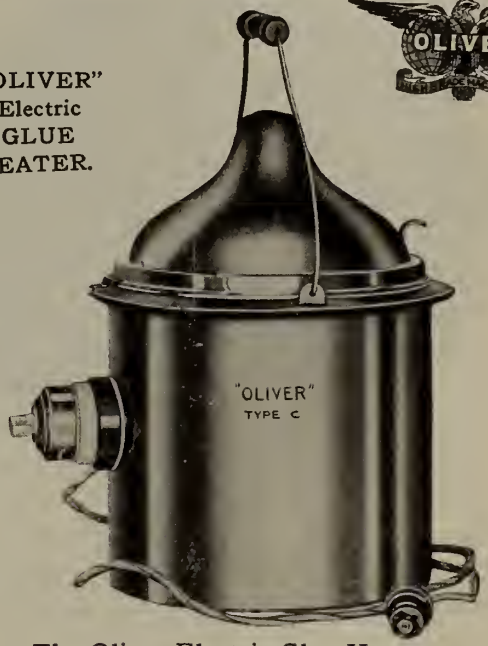

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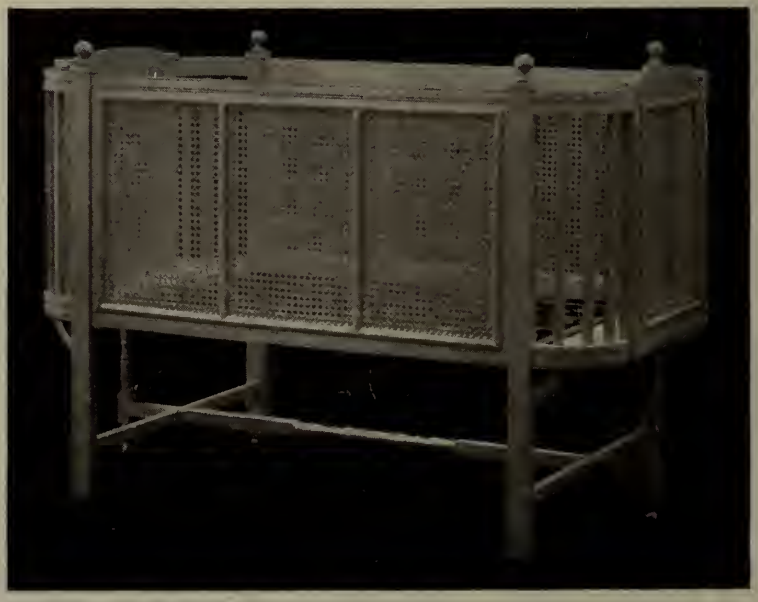

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2873′	1″ —No. 1 C&B	22311′	1¼″—No. 1 C&B
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Complete Stock of Built Up Panels

3 and 5 Ply—Carried in Stock at St. Louis

FIR DRAWER BOTTOMS
FIR DOOR PANELS

Write us for our Stock and Price List

Nichols & Cox Lumber Co.

GRAND RAPIDS - MICHIGAN

We can ship promptly the following items. Can also kiln dry if desired.

2 cars	4/4	1st and 2nd	Sap Gum
5 "	4/4	No. 1 Com.	"
3 "	5/4	No. 1 Com. and Better	"
2 "	6/4	"	"
2 "	8/4	"	"
4 "	6/4	"	Qtd Sap Gum
5 "	8/4	"	"
3 "	10/4	"	"
2 "	12/4	"	"
2 "	4/4	"	Plain Red Gum
1 "	5/4	"	"
1 "	6/4	"	"
1 "	8/4	"	"
2 "	4/4	1st and 2nd	Plain Red Oak
3 "	4/4	No. 1 Com.	"
1 "	5/4	No. 1 C & B	"
1 "	6/4	"	"
1 "	8/4	"	"
1 "	4/4	1st and 2nd	Plain White Oak
2 "	4/4	No. 1 Com.	"
2 "	10/4	No. 1 Com. and Better	Birch
1 "	12/4	"	"
1 "	10/4	"	Basswood
5 "	6/4	No. 2 Com. and Better	Gray Elm
5 "	4/4 to 8/4	No. 1 Com. and Better End Dried	White Maple

Send us your enquiries for anything needed in Northern and Southern Hardwoods.

DIMENSION

My Specialty is

Dimension Lumber

For Manufacturers of

Wagons and Implements, Buggies and Autos, Furniture, Railroad Car and Track Material

Standard Sizes on Hand for Prompt Shipment. Special Sizes Cut to Order

SOUTHERN HARDWOOD LUMBER

C. B. COLBORN

Office, Dimension Mill & Yard
Belt Line at McLean.

MEMPHIS - TENN.

A name that should be on your inquiry list for Hardwood Lumber

American Column & Lumber Co.

Brunson Building, COLUMBUS, OHIO

—Manufacturers of—

West Virginia

Soft Yellow Poplar
Plain White Oak
Plain Red Oak
Quartered White Oak
White Oak Timbers and Plank

Chestnut	Butternut
Basswood	Ash
Maple	Cherry
Hickory	Walnut
Beech	Sycamore
Buckeye	Black Gum
Birch	Hemlock

Oak and Hardwood Dimension Stock

Steele & Hibbard Lumber Co.

ST. LOUIS, MO.

56 Years in Business

We carry a large stock of dry

Hardwood Lumber

25 Different Kinds
Quick Shipment
Write or wire for Prices

We specialize Oak cut from Mild Texture Missouri Timber with thin sap both plain and quarter sawed.

We ship also from Sawmills direct ; Red as well as Sap Gum and Poplar both plain and quarter sawed, Sound Wormy Chestnut, Cypress and Ash.

"Wire collect for prices or other information. Time is Money, delays pay no dividend."

St. Francis Basin Hardwoods

Kraetzer Cured and Air Dried

Tennessee Aromatic Red Cedar

Carloads and less or mixed with Hardwoods

"What Others Say"

"Your letter of February 15th received and we want to say that this was a very nice lot of lumber. It was good widths and lengths and well manufactured, dry stock and the grading was very liberal. We are sorry we cannot use more of this lumber at the present time. ***We received several cars from other manufacturers at a cheaper price but the lumber was not nearly as satisfactory.*** When we are in need of more stock we will take the matter up with you."

(Note—The above was sent us February 24, 1921 unsolicited. Name given on application).

GEO. C. BROWN & COMPANY

Home Office - MEMPHIS, TENN.

BAND MILLS, PROCTOR, ARK. CROOKED BAYOU, ARK.

E. Sondheimer Co. Memphis, Tenn.

Manufacturers and Exporters of the famous Tensas Basin Red Gum, and other hardwood lumber.

We list below a portion of our stock of thoroughly air-dried, band-sawn hardwoods, and solicit your inquiries by mail or wire.

PLAIN RED GUM

100M ft.	5/8	1s & 2s
50M ft.	5/8	No. 1 Com.
75M ft.	3/4	No. 1 Com.
50M ft.	4/4	1s & 2s
50M ft.	4/4	No. 1 Com.
50M ft.	5/4	1s & 2s
100M ft.	5/4	No. 1 Com.

QUARTERED RED GUM

25M ft.	4/4	1s & 2s
100M ft.	4/4	No. 1 Com.
35M ft.	5/4	1s & 2s
50M ft.	5/4	No. 1 Com.
35M ft.	6/4	1s & 2s
50M ft.	6/4	No. 1 Com.
60M ft.	8/4	1s & 2s
60M ft.	8/4	No. 1 Com.
40M ft.	10 & 12/4	No. 1 C&B

QUARTERED SAP GUM

25M ft.	5/4	No. 1 Com.
25M ft.	6/4	FAS
100M ft.	8/4	No. 1 C&B
19M ft.	10/4	No. 1 Com.

PLAIN SAP GUM

100M ft.	5/8	1s & 2s
100M ft.	5/8	No. 1 Com.
50M ft.	3/4	1s & 2s
50M ft.	3/4	No. 1 Com.
100M ft.	4/4	1s & 2s
100M ft.	4/4	No. 1 Com.
100M ft.	5/4	1s & 2s
100M ft.	5/4	No. 1 Com.

PLAIN WHITE OAK

25M ft.	3/4	1s & 2s
50M ft.	3/4	No. 1 Com.
25M ft.	4/4	1s & 2s
25M ft.	4/4	No. 1 Com.

PLAIN RED OAK

100M ft.	3/4	1s & 2s
100M ft.	3/4	No. 1 Com.
100M ft.	4/4	1s & 2s
100M ft.	4/4	No. 1 Com.
25M ft.	8/4	No. 1 C&B

QUARTERED RED OAK

50M ft.	4/4	No. 1 Com.

QUARTERED WHITE OAK

50M ft.	4/4	No. 1 Com.

COTTONWOOD

100M ft.	4/4	1s & 2s
100M ft.	4/4	No. 1 Com.
50M ft.	5/4	1s & 2s
50M ft.	5/4	No. 1 Com.
100M ft.	6/4	1s & 2s
25M ft.	6/4	No. 1 Com.

QUARTERED TUPELO

50M ft.	4/4	No. 1 C&B

PLAIN TUPELO

50M ft.	5/8	No. 1 C&B
50M ft.	3/4	No. 1 C&B
100M ft.	4/4	1s & 2s
100M ft.	4/4	No. 1 Com.
50M ft.	5/4	1s & 2s
50M ft.	5/4	No. 1 Com.
50M ft.	6/4	1s & 2s
50M ft.	6/4	No. 1 Com.

WILLOW

100M ft.	4/4	1s & 2s
200M ft.	4/4	No. 1 Com.
100M ft.	5/4	1s & 2s
100M ft.	5/4	No. 1 Com.
75M ft.	6/4	1s & 2s
15M ft.	6/4	No. 1 Com.
15M ft.	8/4	1s & 2s
50M ft.	8/4	No. 1 Com.

Band-mills at Baton Rouge, La., Tallulah, La., and Sondheimer, La.
Distributing yard and office, Chelsea and McLean Ave. Memphis, Tenn.

The BRAND of QUALITY

Bigelow HARDWOOD PRODUCTS

The SYMBOL of SERVICE

A Complete Stock of Assorted Grades and Thicknesses

NORTHERN HARDWOODS

ASH, BEECH, BIRCH, BASSWOOD
SOFT ELM, ROCK ELM, HARD MAPLE

THE BIGELOW-COOPER CO.

BAY CITY - - MICHIGAN

"Hartzell's Choice Walnut"

The way Walnut comes to us

COMING AND GOING

One constant stream of American Black Walnut from "Stump to Consumer" flowing through a steady, reliable and satisfactory channel.

"Geo. W. Hartzell"

Logs in the rough coming in Veneers and Lumber of the highest quality going out daily year in and year out covering a period of 35 years.

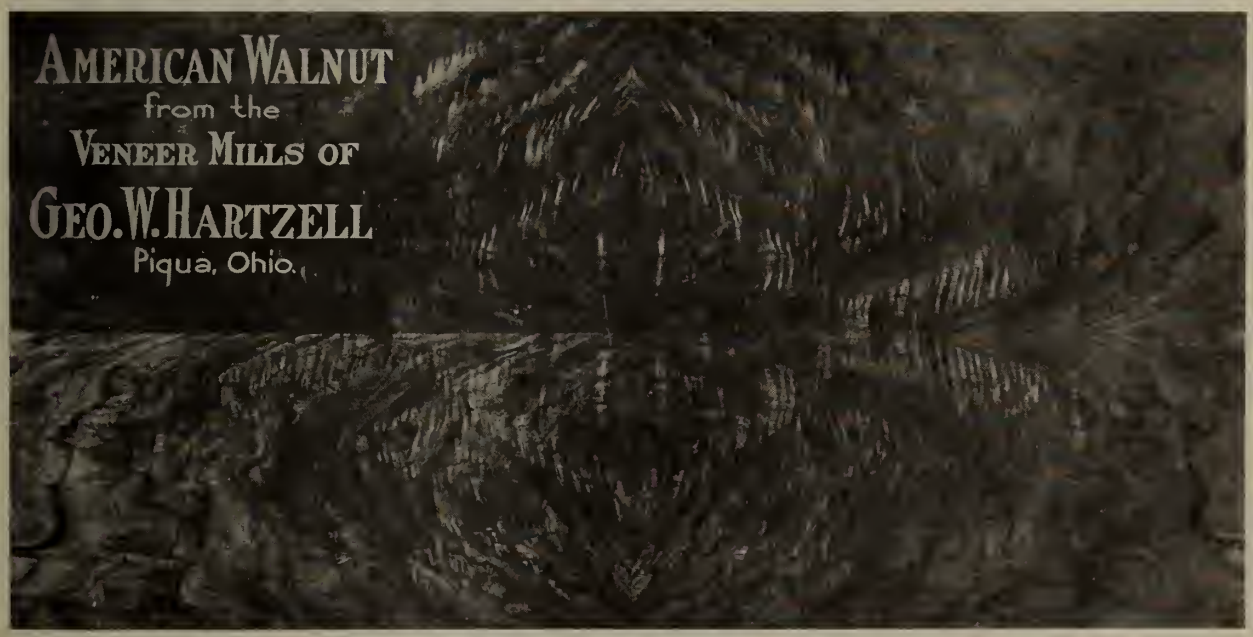
We rightfully claim your patronage because of "SERVICE and QUALITY," if there is any question in your mind about it

"Try Us and We Will Ship You the Convincer"

No Order too large, no Order too small to receive the close and careful attention it is our custom to give. That is a great part of our business, serving our customers.

"WRITE FOR SAMPLES AND QUOTATIONS"

Geo. W. Hartzell - Piqua, Ohio



The way it goes to our Customers

SAM D. SMITH

Wholesale Dealer and Manufacturer in

NORTHERN and SOUTHERN HARDWOODS

305 Kent Building, Toronto

Specialty—Sawing Dimenison Stock to Order

The Hyde Lumber Co.

Band Mills: LAKE PROVIDENCE LA.
Southern Office: MEMPHIS, TENN.
Bank of Commerce Bldg.
Northern Office: SOUTH BEND, IND.

MANUFACTURERS

Plain Red Gum
Quartered Red Gum
Plain Sap Gum
Quartered Sap Gum
Cottonwood, Cypress
Tupelo, Ash, Elm, Oak

CHARLES O. MAUS
Canadian Representative

J. H. Bonner & Sons

Memphis, Tenn.

Mills:
Jonquil and Ruffwood, Ark.

Manufacturers

Band Sawn
Hardwood Lumber

Write or wire for prices on
Gum, Oak, Elm, Etc.

Can You Use the following bone dry stock, which we offer for direct mill shipment, ready for immediate loading. Please wire us at our expense for delivery prices.

2 cars 4/4 Fas Plain White Oak
3 " 4/4 No. 1 Com. & Sel. Pl. White Oak
1 car 4/4 " " " " Red Oak
1 car 5/4 No.1 Com. & Sel. Plain Sap Gum
3 cars 4/4 " " " " " "
2 " 4/4 Fas Plain Sap Gum

Your Enquiries will be appreciated.

GENERAL HARDWOOD LUMBER COMPANY
118 North La Salle Street - - - - - CHICAGO, ILL.

"Quality Lumber Guarantees Value Received"

The Talge Mahogany Co.

INDIANAPOLIS

Offers you the most exclusive line of
Foreign and Domestic Veeners and Lumber

We specialize in
Mahogany, Walnut and Oak

No Order too Small — No Order too Large

Yellow Poplar Lumber Co.

Manufacturers of Band Sawed

Poplar Plain Oak
Quartered Oak
Chestnut Basswood

Capacity 50,000,000 per annum

SPECIALTY: Monogram Brand Oak Flooring

CANADIAN ENQUIRIES SOLICITED

COAL GROVE, OHIO, U. S. A.

Tennessee Lumber & Coal Company

Manufacturers and Wholesalers

APPALACHIAN HARDWOODS

Soft Textured White and Red Oak, Poplar, Chestnut, Southern Gum

OAK TIMBERS AND PLANKING CUT TO ORDER

Band Mills: Verdun, Tenn., Louvain, Tenn. **Submit your enquiries to our Sales office, Cincinnati, Ohio.**

The Pedwell Hardwood Lumber Company

FOOT SPADINA AVE. — TORONTO

Full or mixed cars for immediate delivery.

Hard and Soft Maple
Beech, Birch

Rock and Soft Elm
and Basswood

Hardwoods in 4x4, 4x6, 1″ and 2″. No. 3 Common

Why not get in touch with us.

Lumber

Walnut, Mahogany Plain and Quartered Oak, Ash, Cherry

Veneers

Walnut and Mahogany

WE specialize in AMERICAN BLACK WALNUT and can furnish straight cars from 3/8 to 4 inches in thickness. Also can load mixed cars WALNUT and MAHOGANY LUMBER and VENEERS, PLAIN and QUARTERED RED and WHITE OAK, ASH and CHERRY.

The Kosse, Shoe and Schleyer Co.

Eastern Branch:
BALTIMORE, Md.

Main Office and Band Mill:
CINCINNATI, Ohio

The London Lumber Co. Ltd.

WHOLESALE LUMBER

Will make attractive prices for 4/4 Birch and Elm; immediate shipment. Also have good stock in all thicknesses, Soft & Hard Maple, Ash, and Basswood. Write us for quotations.

487½ Richmond St. London, Ont.

Palmer & Parker Co.

103 Medford St., Charlestown District
BOSTON, MASS.

MANUFACTURERS OF

African, Mexican and Cuban

MAHOGANY

VENEERS and Built-up Panels

TEAK and othe Foreign Woods

Anderson, Shreiner & Mawson

Phone Main 1604 — 43 Victoria St., TORONTO

Lumber Manufacturers and Wholesalers

Birch, Maple, Elm, Ash and Basswood

Write or "Phone" for Prices. — Mills at South River, Ont.

McDonagh Lumber Co.

203-204 Confederation Life Bldg. TORONTO,

Wholesale Hardwoods

Native and Foreign

also Crating Spruce, Pine and Hemlock car lots only

Specialties Canadian Birch, Basswood and Maple

Crating Lumber

We specialize in the following Crating lumbers Spruce, White Pine, Jack Pine, Norway Pine, Balm, Poplar, Birch, Maple, Basswood and Elm.

W. Y. Lloyd

350 Confederation Life Building
TORONTO, CANADA
PHONE MAIN 5532

Stock on Hand in Kitchener for Immediate Shipment

3,000	ft.	4/4 x 10 in. and up Qt'd White Oak Fas.
12,000	"	4/4 x 6 in. and up Qt'd White Oak Fas.
15,000	"	4/4 x 6 in. and up Qt'd White Oak No. 1 com.
2,680	"	3/4 x 13/17 Sap Gum Fas.
4,700	"	3/4 x 3/12 Sap Gum No. 1 Com.
400	"	5/4 x 6 in. Plain red Gum Fas.
4,000	"	4/4 x 6 in. up Sap Gum No. 1 Com.
5,000	"	8/4 x 6 in. up Qt'd red Gum C. & B.
8,000	"	5/4 x 6 in. Plain White Oak Fas. ... ...
2,000	"	6/4 x 4 in. Plain White Oak No. 1 Com.
15,000	"	6/4 x 6 in. Plain red Oak Fas.
10,000	"	8/4 x 6 in. Plain red Oak Fas.
25,000	"	8/4 x 4 in. Plain red Oak No. 1 Com.
12,000	"	4/4 x 3 in. Tenn. Red Cedar No. 1 C. & B.
25,000	"	8/4 Sound Wormy Chestnut
2,000	"	5/4 Sount Wormy Chestnut
32,000	"	6/4 Sound Wormy Chestnut
5,000	"	4/4 Chestnut No. 1 C. & B.
10,000	"	5/4 Chestnut No. 1 C. & B.
10,000	"	6/4 Chestnut No. 1 C. & B.
43,000	"	4/4 Soft Elm No. 3 C. & B.
1,000	"	4/4 Soft Elm No. 3 Common
12,000	"	8/4 Soft Elm No. 2 C. & B.
15,000	"	12/4 Soft Elm No. 2 C. & B.
5,285	"	12/4 Oak No. 2 Common & Better
6,000	"	12/4 Oak No. 2 and 3 Common
12,000	"	4/4 Hard and soft Maple No. 3 C. & B.

PERCY E. HEENEY

Office: 298 Breithaupt St., KITCHENER, ONT.

J. R. EATON & SONS, LIMITED

MANUFACTURERS OF HIGH GRADE WOOD PRODUCTS

Wood Turnings, Hardwood Dowels, Turned Table Legs, Kitchen Tables, Kitchen Cabinets, Oak Extension Tables, Oak Library Tables, "Empire Brand" Hardwood Flooring in Maple, Birch, and Plain or Quarter Cut Oak, Solid Pine and Veneered Hardwood Doors.

A Large Factory equipped with up-to-date machinery is at your service to furnish "WHAT YOU WANT"— WHEN YOU WANT IT."

YOUR ENQUIRIES SOLICITED

Orillia — Ontario — Canada

Buffalo for Hardwoods

"LET BUFFALO DO IT"

Do you want prompt shipment? We can give you service. Buffalo dealers have 60,000,000 to 75,000,000 feet of dry hardwoods of all kinds and thicknesses.

Immediate shipments and deliveries can be made on any of the 25 railroads entering the city. Buy Hardwoods in Buffalo.

Frank T. Sullivan
Specialities:
CHERRY, WALNUT and PACIFIC COAST WOODS
Main Office: 600 Ellicott Square.
Yard: 2598 Delaware Avenue.

T. Sullivan & Company
Northern Grey Elm
and
Brown Ash
Niagara Street Cornor Arthur

ATLANTIC LUMBER COMPANY
HARDWOODS
West Virginia Soft Red and White Oak
Our Speciality: West Virginia and Pennsylvania Cherry
1055 Seneca Street

Miller, Sturm & Miller
1142 Seneca Street
Hardwoods of All Kinds

YEAGER LUMBER CO., Inc.
SPECIALITIES
Oak, Poplar, Ash, Maple
932 Elk Street.

STANDARD HARDWOOD LUMBER COMPANY
HARDWOODS
Prompt Shipment { From Buffalo Yards or from mill direct to you
8 Million Feet Dry Stock on hand
1333 Clinton St.

G. Elias & BRO., Inc.
Established 1881
All Kinds of Hardwood Lumber
And in addition we carry a full line of White Pine, Yellow Pine, Spruce, Hemlock and fir timber, Lumber, Millwork and Boxes—Maple and Oak Flooring
Careful attention to mixed car orders.

Buffalo Hardwood Lumber Co.
J. B WALL Pres. T. H. WALL Vice-Pr.
M. M. WALL, Treasurer
940 SENECA ST.
We Specialize in White Ash, Oak, Maple
We also handle a complete stock of Quartered Oak, Maple, Poplar, Red Cedar, etc.

HUGH McLEAN LUMBER CO.
Hardwoods of all Kinds
Our Specialties—QUARTERED WHITE OAK, SAP AND RED GUM
940 ELK STREET

TAYLOR & CRATE
Hardwoods of All Kinds
A stock of 18,000,000 to 20,000,000 feet of hardwoods carried at all times at our two big Buffalo Yards
Established 50 Years
RAIL OR CARGO SHIPMENTS

Blakeslee, Perrin & Darling
A Complete Stock of Seasoned Hardwoods
including Ash, Basswood, Birch, Cherry, Chestnut, Cypress, Elm, Gum, Hickory, Maple, Plain and Quartered Oak, Poplar and Walnut.
1100 Seneca Street

Tabasco
Honduras

ESTABLISHED 1867
INCORPORATED 1886

Laguna
Mexican

MAHOGANY

Rarely are such stores of precious wood to be found as may be seen in our yards. Across the seas from tropic lands it comes. From thick jungles where the light of day but dimly penetrates and where tangled native paths make difficult the bringing out of timber. Here the black man labors, risking life from jungle dangers, that supplies will not diminish and your orders may be filled.

Twelve million feet per year is the capacity of OTIS mills. An adequate supply is always on hand for prompt shipment. Get our prices.

Otis Manufacturing Company

Peters Avenue and The River

NEW ORLEANS, LA.

Chicago Office: Room 208, 128 N. Wells Street

Mercerau-Hawkins Tie Company

Huntington - W. Va.

Manufacturers and Wholesale Dealers

West Virginia and Southern

HARDWOODS

We specialize in

Oak Tie Siding
White and Red Oak
Yellow Poplar
Basswood
Chestnut and
Gum Lumber.

Canadian Sales in Charge of

C. W. PETERS

Vice President and Manager of Lumber Dept.

Do Not Gamble on Your Veneer Tapes

BUY THE BEST.

Ideal Veneer Tapes

The material with the guarantee behind it

Profit by our many years' careful application to the subject of Veneer Tapes.

We have several qualities, cloth and paper, plain and perforated, which will cover all of your requirements.

Write for booklet.

IDEAL COATED PAPER CO.

Veneer Tape Specialists

Main Offices and Mills, BROOKFIELD, Mass

William S. Whiting Company

JOHNSON CITY, TENNESSEE

1 Band Mill — *5 Circular Mills*

Hardwood Lumber

Oak	Basswood
Maple	Buckeye
Chestnut	Poplar
Ash	Birch

Rotary-Cut Soft Yellow Poplar Veneers
Quarter-Sawn White Oak Flitches
Sliced and Sawn Quartered White Oak Veneers
Oak and Maple Flooring
Dowel Pins and Dowel Rods
Glued-Up Chestnut Cores and Dimension

5-16" Oak Parquetry Flooring Strips and Squares carried in stock at our warehouses:
138 44th St., Brooklyn, N.Y., and at Elizabethton, Tenn.

Arkla Lumber & Mfg. Company

Main Office: - St. Louis, Mo

Manufacturers and Wholesalers

Ash—Plain and Qtd.
White and Red Oak
Poplar, Cypress, Gum

In addition to stocks at Mill, we carry a well assorted dry stock of all items on our St. Louis yard available for immediate shipment. Write or wire us (our expense) for quotations.

F. HUNTINGTON SMITH
Canadian Representative

Miller Lumber Company

Marianna - Arkansas

QUARTERED WHITE OAK

300,000′	4/4	No. 1 Com.
20,000′	5/4	No. 1 Com.
8,000′	8/4	No. 1 Com.
150,000′	4/4	No. 2 Com.
2,000′	5/4	No. 2 Com.

PLAIN WHITE OAK

70,000′	4/4	FAS
13,500′	5/4	FAS
300,000′	4/4	No. 1 Com.
42,000′	6/4	No. 1 Com.
35,000′	8/4	No. 1 Com.
300,000′	4/4	No. 2 Com.
11,500′	5/4	No. 2 Com.
10,500′	6/4	No. 2 Com.
20,000′	8/4	No. 2

QUARTERED RED OAK

3,200′	3/4	C & Btr.
150,000′	4/4	Nos. 1 & 2 Com.
1,000′	5/4	No. 2 C & Btr.
3,500′	8/4	No. 2 C & Btr.

PLAIN RED OAK

75,000′	4/4	FAS
13,500′	5/4	FAS
5,000′	8/4	FAS
600,000′	4/4	No. 1 Com.
33,000′	5/4	No. 1 Com.
11,000′	6/4	No. 1 Com.
48,000′	8/4	No. 1 Com.
600,000′	4/4	No. 2 Com.
9,400′	5/4	No. 2 Com.
3,000′	8/4	No. 2 Com.

MISCELLANEOUS OAK

3,700′	3/4	No. 2 C & B Qt. W. O.
5,000′	4/4	Cl. Pl. RO Stps 3-5 1/2″
8,500′	4/4	Cl. Pl. WO Stps 3-5 1/2″
7,300′	5/4	Pl. RO Step Plk. 11″ & Wdr.
5,500′	3/4	No. 2 C & B Pl. R & WO.
160,000′	4/4	S.W. R & WO.
300,000′	4/4	No. 3 Com.
20,000′	5/4	No. 3 Com.
22,000′	6/4	No. 3 Com.
12,000′	8/4	No. 3 Com.
50,000′	8/4	Bridge Plk. R & W
50,000′	10/4	" " " fwd.
200,000′	12/4	" " "

SYCAMORE

130,000′	4/4	No. 2 C & B Qtd.
1,000′	5/4	No. 2 C & B Qtd.
400,000′	4/4	No. 1 C & B

QUARTERED RED GUM

25,000′	5/4	No. 1 C & Btr.
15,000′	6/4	No. 1 C & Btr.

PLAIN RED GUM

1,100′	5/8	FAS
1,800′	3/4	No. 2 C & Btr.
40,000′	4/4	No. 2 Com.
3,300′	8/4	No. 2 C & Btr.

SAP GUM

4,200′	4/4	Pnl & No. 1 18″ & Up
50,000′	4/4	Clr strips 3-5 1/2″
20,000′	4/4	No. 1 C stps 2-5 1/2″
125,000′	4/4	Box Bds. 9-12″
150,000′	4/4	Box Bds. 13-17″
6,500′	5/4	No. 1 Com.
50,000′	6/4	No. 1 C & Btr.
6,000′	8/4	No. 1 C & Btr. Qtd.
9,500′	8/4	No. 1 C & Btr. Qtd. Stps

TUPELO

50,000′	4/4	FAS 6-12″
5,000′	4/4	FAS 13-17″
5,000′	4/4	No. 1 Com. 13-17″
12,500′	4/4	Box Bds. 9-12″
3,700′	4/4	Box Bds. 13-17″

COTTONWOOD

100,000′	4/4	FAS 6-12
30,000′	4/4	FAS 13-17″
15,000′	4/4	pnl & No. 1 18″ & Up
40,000′	4/4	Box Bds. 9-12″
30,000′	4/4	Box Bds. 13-17″
150,000′	4/4	No. 1 Com.
100,000′	4/4	No. 2 Com.

MAPLE

40,000	4/4	No. 2 C & Btr.
50,000′	5/4	No. 2 C & Btr.
75,000′	6/4	No. 2 C & Btr.
20,000′	10/4	No. 2 C & Btr

CYPRESS

20,000′	4/4	FAS
9,000′	5/4	FAS
10,700′	6/4	FAS
20,000′	8/4	FAS
250,000′	4/4	No. 1 Shop
15,000′	8/4	No. 1 Shop
30,000′	5/4	No. 1 Com.

BY MAKING TEST RUNS OF YOUR LUMBER

You will find that our stock will reduce your costs to a minimum and improve the quality of your product. Indiana hardwoods cost no more than the other kinds—then why not use them ?

Wo are the largest hardwood producers in Indiana and give below a partial list of stock on hand:

INDIANA QUARTERED WHITE OAK

	1s & 2s	No. 1 Com.	No. 2 Com.
1/2″	1 car	1 car	
5/8″	2 "	4 "	
3/4″	1 "	5 "	1 car
4/4″	3 "	4 "	4 "
5/4″	1 "	3 "	1 "
6/4″	1 "	3 "	
8/4″	1 "	2 "	

Also Clear and No. 1 Common Quartered White Oak Strips.

INDIANA QUARTERED RED OAK

	1s & 2s 6″ & up	1s & 2s 9″ & up	No. 1 Com.	No. 2 Com.
1/2″—3500′				
5/8″—1 car			1 car	
4/4″—3 car		1 car	3 "	1 car
5/4″—2 "		1 "	2 "	
6/4″—2 "		2500′	1 "	
7/4″—1 "		4500′		
8/4″—2000′		3000′	1 "	

PLAIN WHITE OAK

	1s & 2s	No. 1 Com.	No. 2 Com.
5/8″	1 car	1 car	
3/4″		4000′	
4/4″	2 "	4 cars	2 cars
5/4″	1 "	3 "	1 "
6/4″	1 "	2 "	
8/4″	3 "	2 "	
2½″	½ "	1 "	

PLAIN RED OAK

	1s & 2s	No. 1 Com.	No. 2 Com.
5/8″	2 cars	2 cars	
3/4″		5000′	
4/4″	4 "	4 cars	3 cars
5/4″	1 "	3 "	
6/4″	1 "	4 "	
8/4″	2 "	3 "	
2½″	2 "	3 "	

BLACK WALNUT—Steamed Stock

	1s & 2s	No. 1 Com.	No. 2 Com.
4/4″	1 car	3 cars	12000′
5/4″	1 "	1 "	9000′
6/4″	4000′	4000′	
8/4″	1 car	1 car	

1 car 5/8″ Log Run, not steamed.

WE ARE IN POSITION TO KILN DRY THIS LUMBER. ASK FOR OUR RATES.

We also have good stocks of Poplar, Ash, Beech, Hickory, Maple, Gum, Tupelo, etc.—Write us for prices.

Maley & Wertz Lumber Company

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MILLS AT EVANSVILLE, IND., GRAMMER, IND., and KEIRNS, MISS.

Hardwoods

We can furnish you immediately Factory Stock including all grades and thicknesses of

Walnut, Chestnut
Mahogany, Teak, Oak
Ash, Cypress

ALSO

VENEERS

Oak, Maple, Walnut and other Fancy Woods

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Limited
MONTREAL

Hardwood Dowels

Plain, Straight and Spiral Grooved

"Canada Wood" dowels are manufactured from high-grade Maple, Birch, Beech or White Oak, uniform in length and nicely pointed, quality guaranteed.

We also manufacture Bailwoods and Variety Turnings in all styles, sizes and descriptions, in the plain, or Enamelled in Black, Natural Wood or Mahogany finishes. Three-eighth in. Maple, Birch and Quarter Cut White Oak Flooring a Specialty. Broom and Mop Handles of every description.

Canada Wood Specialty Co.
Orillia, Ontario
Sawmills at Zebra and Orillia, Ont.
Cable Address: "Special," Orillia, Can.

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HARDWOODS of the same kind differ greatly in quality in different localities. The St. Francis River Delta is noted the world over for the perfection of its trees and it is in the heart of this district that Chapman-Dewey hardwoods are cut Our three modern sawmills operate in our own 50,000 acre tract, milling only logs adaptable for specific purposes.

The recent sudden revival of hardwood lumber buying is fast depleting available stocks everywhere. The situation is rendered more serious from the fact that, among all mills, only about 10 per cent of the normal amount of logs have been put out this fall. This condition will undoubtedly result in a hardwood shortage by spring, with greatly increased prices as a natural consequence. The facts indicate that now is a good time to stock up on hardwoods.

Wire our expense for price quotations.

Oak, Ash, Red Gum, Sap Gum, Sycamore, Cottonwood Cypress, Maple, Elm.

Chapman and Dewey Lumber Co.
Bank of Commerce Trust Bldg., Memphis, Tenn.
Branch Office: Rialto Bldg., Kansas City, Mo.

Sawed Veneer

Quartered White Oak
For Furniture and Panels

Plain Red Oak
For Interior Trim and Doors

Cypress
For Battery Separators

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Quality Unsurpassed

James E. Stark & Co., Inc.
MEMPHIS, TENN.

BEDNA YOUNG
Lumber Company
Jackson - Tennessee

Manufacturers of

Quartered White Oak
Quartered Red Oak
and Other Hardwoods

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High Grade Lumber
please let us have your enquiries.
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Indianapolis, Indiana

Southern Hardwoods

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for Exacting Buyers

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MANUFACTURERS
MEMPHIS, TENN.

Band Mill: Little Rock
Oak Flooring Plants: Memphis; Little Rock

We specialize in Birch, Basswood, Hard Maple

A High Standard of Quality and Service

500M	4-4	Unselected	Birch		500 M	4-4	Basswood		500M	4-4	Hard Maple
300M	5-4	"	"		300M	5-4	"		400	5-4	"
150	6-4	"	"		200	6-4	"		400	6-4	"
125	8-4	"	"		75	8-4	"		600	8-4	"
150	10-4	"	"						400	10-4	"
150	12-4	"	"						300	12-4	"
75	14-4	"	"						75	14-4	"
75	i6-4	"	"						100	16-4	"

Sawyer Goodman Company

Marinette - Wisconsin

WE ARE TELLING THE PUBLIC: "BE SURE YOUR WALNUT IS REAL WALNUT."

AMERICAN WALNUT

"The Cabinet-wood of the Ages."

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THEY LIKE WALNUT

It is largely due to our persistent and steadily increasing national campaign of advertising, as well as to the superior merits of the wood itself, that the almost universal preference is for American Walnut for furniture, paneling, trim, etc., in good buildings of all types.

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GUM
CYPRESS
TUPELO
SOFT MAPLE

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General Office - FORT WAYNE, Ind.

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Prompt **SPECIAL**
Plain White Oak
50 M' 1" FAS
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ASH
OAK
POPLAR
CHESTNUT

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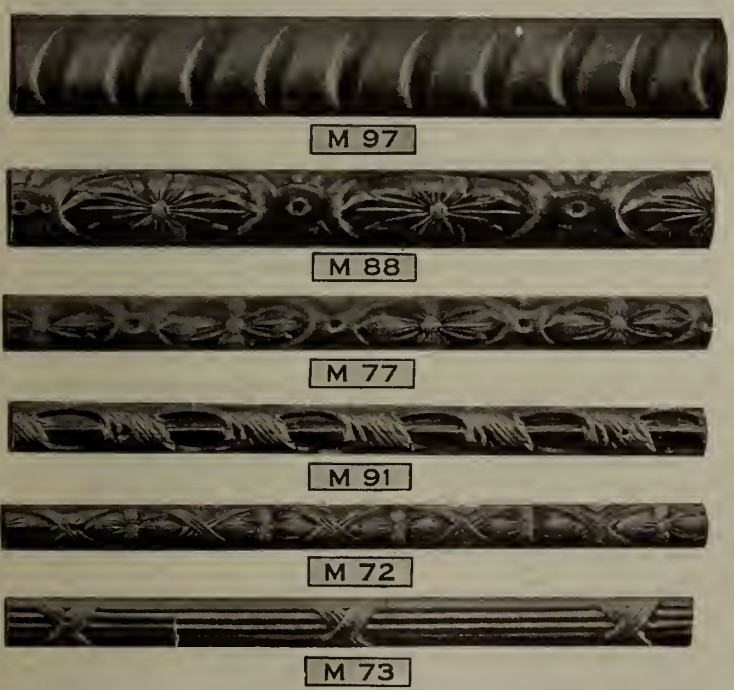

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KNOBS The Period Knobs we placed on the market a few months ago are proving very popular. If you have not received samples ask for them now.

ROSETTES A new Period item to accompany the knobs.

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BAND SAWN **MAHOGANY LUMBER** EXCLUSIVELY

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WILLIAMSPORT, PENNSYLVANIA

Manufacturers of

Northern and Southern Hardwoods White Pine, Spruce and Hemlock

With special attention to **Oak, Chestnut, Poplar, Cherry, Walnut, Gum and Basswood.**

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REASONABLE PRICES - that you can afford to pay.
EFFICIENT SERVICE — that you have a right to expect
FAIR TREATMENT — that you can depend on getting

We would appreciate an opportunity of furnishing a portion of your lumber requirements.

L. D. MURRELLE LUMBER COMPANY

BAND MILL : BUDE, MISS.

General Sales Offices : 1524 Exchange Building, Memphis, Tenn.

A few Specials :

130,000 ft. 4-4" No. 1 and No. 2 Com. Qtrd. White Oak
85,000 ft. 4-4" No. 1 and No. 2 Com. Qtrd. Red Oak
100,000 ft. 4-4 No. 1 and No. 2 Com. Plain Red Oak

Manufacturers of White and Red Oak, Poplar, Gum, Ash, Magnolia and Beech

We Specialize in Quartered WHITE OAK and POPLAR

Stimson Veneer and Lumber Co.

(Inc.)

Office and Mill: McLean Ave. and Union Belt R.R.

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We sell only the product of our own mills and make band sawn lumber in all Southern Hardwoods.

We specialize in Quartered White Oak, Red Oak, and Red Gum.

With allied companies we make fifty million feet annually.

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Memphis - Tenn.

STOCK LIST

QUARTERED WHITE OAK
- 3 cars 4/4" 1s and 2s.
- 5 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common .

QUARTERED RED OAK
- 5 cars 4/4" 1s and 2s.
- 10 cars 4/4" No. 1 Common.
- 4 cars 4/4" No. 2 Common.
- 2 cars 6/4" No. 1 Common and Better.

QUARTERED RED GUM
- 10 cars 4/4" 1s and 2s.
- 3 cars 4/4" 1s and 2s Fig.
- 2 cars 5/4" 1s and 2s.
- 2 cars 6/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 2 cars 5/4" No. 1 Common.
- 2 cars 6/4" No. 1 Common.

QUARTERED RED GUM, Sap no Defect
- 5 cars 6/4" No. 1 Common and Better.
- 10 cars 8/4" No. 1 Common and Better.

ASH
- 4 cars 10/4" No. 1 Common and Better.
- 1 car 12/4" No. 1 Common and Better.
- 1 car 6/4" No. 1 Common and Better.
- 2 cars 4/4" No. 1 Common.
- 2 cars 4/4" No. 2 Common.

SAP GUM
- 10 cars 4/4" 1s and 2s.
- 20 cars 4/4" No. 1 Common.
- 10 cars 4/4" No. 2 Common.
- 2 cars 4/4" 18" up Panel.
- 5 cars 4/4" 13-17" Box Boards.

PLAIN RED OAK
- 2 cars 4/4" 1s and 2s.
- 2 cars 6/4" No. 1 Common and Better.
- 2 cars 10/4" No. 1 Common and Better.

PLAIN WHITE OAK
- 4 cars 4/4" No. 1 Common Plain.

COTTONWOOD
- 2 cars 4/4" 1s and 2s.
- 15 cars 4/4" No. 1 Common.
- 5 cars 4/4" No. 2 Common.

ELM
- 2 cars 4/4" Log Run.
- 10 cars 10/4" Log Run.
- 10 cars 12/4" Log Run.

MAPLE
- 4 cars 12/4" Log Run.

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Our timber, of virgin growth in Greenbrier and Pocahontas Counties, limestone soil, gives a combination of Texture, Quality and Character that is most desirable to the Woodworking trade.

The most critical Hardwood users are among our best accounts. Why?

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A "Quality" you will admire
A "Service" you will appreciate

We have the facilities for giving Canadian Woodworkers and Furniture Manufacturers a prompt service on straight or mixed cars of the following:

Ash, Oak, Gum, Poplar, Hickory, Walnut, Chestnut, Beech, Maple, Elm, Sycamore, Cottonwood.

Soft textured Plain and finely figured Quarter-Sawn Red and White Oak our specialty.

J. V. Stimson & Company
OWENSBORO - KENTUCKY
Bandmills: Owensboro; Campbellsville, Kentucky

D. E. Hewit Lumber Co.

Huntington, W. Va.

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West Virginia Hardwoods

(Not Better than the Best but as Good as the Best

FAS Plain White and Red Oak
No. 1 Com. Plain White and Red Oak
Implement Oak
Sound Wormy Chestnut
No. 1 Common and Better Chestnut
Hickory Plank
Poplar and Basswood

Reputation - Making Lumber

The person buying a piece of furniture is often attracted by the beauty of the wood even before looking for signs of good workmanship and other essentials.

That is the kind of lumber you want.

And we do not hesitate in saying we can supply you with it.

Just let us have a trial order.

Memphis Band Mill Company

"Makers of high grade lumber"

QUALITY Memphis - Tennessee SERVICE

Efficiency Marks Every Step of Our Service to You

Exact photograph of alley in our yard

White and Red Oak

Plain & Quarter Sawed Red Gum

Our Specialty Quarter Sawed Red Gum in Plain and Figured Wood

From the cutting to the delivery to your hands, our entire stock receives the most careful attention. All the excellence of quality and the beauty of the wood is kept just as it is when cut. When next you are in need of Oak, Ash, Elm, and Cypress of first class quality and in perfect condition write us. We can ship promptly.

BARR-HOLADAY LUMBER CO.

BAND MILL AT LOUISE, MISS. **GREENFIELD, OHIO**

OAK

Plain and Quartered
Uniform Color—Soft Texture

Poplar, Ash

and other

Hardwoods

We carry 35,000,000 feet dry stock—all of our own manufacture.

Oak Timbers and Planking

The Mowbray & Robinson Co.
(INCORPORATED)
Manufacturers
Office: CINCINNATI, OHIO

MILLS
Quicksand, Ky.; West Irvine, Ky.

Canadian Representative:
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Frank Purcell
Walnut Lumber Co.

Plenty of logs like the portion of our stock shown above have made possible the million and a half foot stock of well manufactured American Walnut Lumber which we now have to offer.

Prompt shipment
All grades and thicknesses
Guaranteed Inspection

12th AND BELT LINE
Kansas City - Kansas

WIS

This yard was BUILT or perfect drying. The appearance of the piles will convince every man who knows hardwood lumber.

Lumber Can't Be ALWAYS Good Without Perfect Piling

The *correct* drying of hardwood lumber is a science based on definite formulae. Recognizing this, our yard was *built* to insure the most perfect possible drying.

Everyone familiar with lumber will recognize what the appearance of the piles in the accompanying photograph means. They are your guarantee of flat, straight, clean lumber.

Our list includes the standard species and grades of southern hardwoods with NOTHING PICKED OUT, and has behind it a comprehensive and conscientious desire to give the customer his full measure of value and service,

Wisconsin Lumber Company
Chicago, Illinois
BAND MILLS, DEERING, M O.

SOUTHERN HARDWOODS

Dry Lumber in Buffalo for Quick Shipment

TENESSEE SCENTED CEDAR

1 in.—58,000
1¼ in.— 3,500
1½ in.—

CHERRY

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
1 in.	44,500	......	203,900	18,500
1¼ in	4,900	......	37,600	7,500
1½ in.	2,000	......	34,700	36,300
2 in.	6,000	......	22,200	61,900
2½ in.	5,500	......	4,300	2,200
3 in.	25,700	......	6,500	3,300
4 in.	4,000	......	900	400

CHESTNUT

	1 & 2	Clear Strips.	No. 1 Com.	S.W. & No. 2 Com.
¾ in.	500	......	56,000	91,000
1 in.	11,000	500	45,000	1,000
1¼ in.	66,800	300	100,200	159,200
1½ in.	34,500	......	40,000	......
2 in.	2,200	......	15,300	89,200
2½ in.	4,000	......	1,500	......
3 in.	1,100	......	1,000	500
4 in.	1,500	......	......	......

QUARTERED WHITE OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
½ in.	6,500	......	......	......
¾ in.	900	300	23,600	9,000
⅝ in.	2,800	......	5,500	800
1 in.	17,300	10,000	52,400	27,000
1¼ in.	5,000	......	6,000	......
1½ in.	600	......	2,400	......
2 in.	......	......	25,100	5,700
2½ in.	2,000	......	400	......
3 in.	2,000	......	1,300	......
4 in.	2,500	......	1,700	......

PLAIN WHITE OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
⅜ in.	1,000	......	......	......
½ in.	100	......	......	......
⅝ in.	2,150	......	8,000	16,900
¾ in.	274,800	......	453,800	122,000
1 in.	42,300	1,700	78,000	85,200
1¼ in.	6,300	......	15,100	......
1½ in.	51,300	......	84,000	12,000
2 in.	29,000	......	125,000	54,000
2½ in.	152,800	......	69,500	3,000
3 in.	55,800	......	75,800	14,400
3½ in.	4,500	......	4,000	1,500
4 in.	65,000	......	38,500	6,000

PLAIN RED OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
⅜ in.	24,200	......	......	......
¾ in.	170,000	......	327,000	65,800
⅝ in.	2,400	......	77,000	42,600
1 in.	30,200	3,150	56,000	125,400
1¼ in.	11,700	2,400	16,600	......
1½ in.	138,900	4,300	46,200	32,000
2 in.	91,500	......	162,000	71,000
2½ in.	70,100	......	26,000	3,700
3 in.	23,800	......	20,500	7,000
4 in.	16,600	......	10,900	......

QUARTERED RED OAK

	1 & 2	Clear Strips.	No. 1 Com.	No. 2 Com.
¾ in.	1,700	......	9,700	500
1 in.	10,200	5,400	7,500	1,400
1¼ in.	2,000	......	......	......
1½ in.	......	......	......	......
2 in.	......	......	7,400	......

SAP GUM

	1 & 2	Strips.	No. 1 Com.	No. 2 Com.
1 in.	......	16,000	21,000	......
1¼ in.	......	......	......	......
1½ in.	......	2,400	6,000	13,500
2 in.	......	......	5,700	10,400
2½ in.	......	......	......	......

QUARTERED SAP GUM

	1 & 2	No. 1C	No. 2C
4/4	......	2,500	12,000
5/4	14,000	......	......
8/4	20,000	9,000	200
10/4	10,250	23,000	1,800

PLAIN RED GUM

			No. 1	No. 2
1 in.	......	16,300	10,900	9,500
1¼ in.	......	6'000	8,325	......
1½ in.	......	12,000	13,300	9,500
2 in.	......	9,000	3,000	5,500

QUARTERED RED GUM

	1 & 2	No. 1C	No. 2C
4/4	2,000	6,000	7,000
5/4	9,400	10,800	......
6/4	8,900	5,500	4,600
8/4	1,300	19,500	3,600

POPLAR

	1 & 2	Bright Saps	No. 1 Com.	No.2 Com.
⅝ in.	18,000	15,800	31,300	800
1 in.	27,000	5,200	91,900	......
1¼ in.	22,300	360	5,700	6,000
1½ in.	19,100	13,000	29,000	7,500
2 in.	15,000	......	10,500	24,500
2½ in.	10,800	6,000	......	......
3 in.	17,900	......	11,400	47,000
4 in.	6,500	......	300	450

Also Large Stocks of Ash, Basswood, Beech, Birch, Hard and Soft Maple.

THE ATLANTIC LUMBER CO., 310 Manning Chambers, Toronto

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Yards: BUFFALO, N.Y.   Mills: KNOXVILLE, TENN.; FONDE, KENTUCKY

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Our Dry Kilns have a capacity for drying 200,000 feet per month. We will dry your transit cars.

All Canadian and American Hardwoods
Mahogany, Walnut, Veneers and Panels of every description

Kiln dried stock carried in all woods

VENEERS—Mahogany, Walnut, Oak, Birch, Basswood, Ash, Maple, Elm and Gum
Log run or cut to dimension

PANELS—Birch, Basswood, Ash, Maple, Elm, Mahogany, Walnut and Oak

We Specialize in Mixed Shipments of Dry Hardwoods, Veneers and Panels

This is a good time to conserve your capital by making purchases in this manner

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1 Spadina Avenue, TORONTO

Lumber Yard, Dry Kilns and Mill
Foot Spadina Ave., TORONTO

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and
Furniture Manufacturer

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Vol. 21 Toronto, December, 1921 No. 12

What of the New Year?

St. Paul, the apostle, once said:—"Forgetting the things that are past, I press toward the goal." That advice is good to-day as far as oneness of purpose is concerned, but the past, especially the last two years, has some lessons which should not be lost. Two years ago we were enjoying a boom such as has been seldom experienced. The public had gone buying-mad. Furniture, wood products, in fact most commodities, were in strong demand. Prices rose overnight and factories were taxed to capacity. Except for a few far-sighted individuals, the general impression seemed to be that the good times would last indefinitely. Prices reached such high levels that the public refused to buy and the inevitable reaction followed.

Eighteen months ago lumber values, aided by a combination of circumstances, together with a short-sighted policy on the part of lumber users, soared to undreamed-of heights. Production was increased. Suddenly wood users found that they could not sell their product at prices based on current lumber values. The demand fell off, cancellations quickly followed and the descent was as spectacular and precipitous as the rise had been.

Two months ago the lumber market touched the other extreme. There was little or no demand. Values had declined until they were at or even below manufacturing costs. Production was reduced until it was estimated to be but a small percentage of normal. Many stocks were cut and slashed in an effort to meet pressing liabilities. With production at such a low point, it was to be expected that stocks would become broken and that certain items would be practically off the lists. When this was realized, many manufacturers entered the market and prices stiffened. Is the lesson of the last eighteen months to be lost, will wood users refrain from buying until the last possible moment and then come in with a rush, or will they profit by the past and buy now in a careful, conservative manner?

The furniture industry dropped from peak production to about 40 per cent of normal. The demand for this line has slowly but surely improved. To-day the factories are operating at about 70 per cent of normal capacity. The retail furniture trade has held up remarkably well. Stocks on the floors of the different stores are reported to be low. The January furniture exhibitions, which are being held in Toronto, Kitchener and Stratford, are expected to result in a satisfactory volume of orders. Furniture prices are at rock bottom, though this fact is not accepted by the dealers in general, and any price movement will, probably, be upward. It is not anticipated that many lines will show any great change. The publicity work of the Home Furnishings Bureau should add to the volume of business to be done. Taking it all in all, the furniture manufacturers have every reason to look to 1922 with optimism and renewed hope. The same applies to the piano and phonograph industries.

In the general woodworking field, business is remarkably good. The open fall has resulted in building activities, particularly residential work, being carried on at almost summer pace. With building costs well down from the high levels of last year, reductions having taken place in practically all items entering into the construction of a home, coupled with the pent-up demand for houses, it is probable that the opening of spring will witness a resumption of building on a satisfactory scale.

The woodworking industry is in an enviable position and may well view the advent of 1922 with optimism. A large proportion of wood products enter either into the construction of homes and other buildings or their furnishing. With a strong pent-up demand for buildings of all kinds—a demand which cannot be put off for an indefinite period and which will, in all probability, be met, in part, at least, during the coming year—it would seem as if the future holds good things in store for those engaged in this industry.

Prices must be kept as low as possible. Any tendency to force values up will only result in slowing up demand. One way to stimulate sales is through lower prices made possible by decreased production costs. This can be brought about by the elimination of waste both of material and labor and the use of modern production equipment. The February "Canadian Woodworker and Furniture Manufacturer" will be a special "Modern Methods Furniture Number," dealing with the newer developments in equipment and the furniture manufacturing methods. The ideas which are to be included in this issue will assist woodworkers in keeping their costs within reasonable limits.

Internal or External Competition—Which?

Shall Furniture Manufacturers Compete With Themselves or With Other Industries—Passive Attitude Does not Tend for Progress—What Furniture Makers can do to Increase Volume of Business

By L. R. WRIGHT

With the drawing to a close of the Fall publicity campaign of the Home Furnishings Bureau, it is only natural that one's thoughts should turn to the future, particularly to 1922. What should be done to boost the sales of furniture during the coming year? Is it enough that the furniture manufacturers put forth greater sales effort, and thus increase competition among themselves, for whatever volume of business next year may happen to provide? If it is possible to enlarge the market for furniture, to create a greater volume of business, would it not be the part of wisdom for all furniture makers to work together and centre their energies in this direction rather than vie with each other for a lion's share of what ordinarily would offer.

Several furniture manufacturers have intimated to the "Canadian Woodworker and Furniture Manufacturer" that at the present time their efforts are centered on making sales rather than on manufacturing and that they are more interested in how to bring in more orders than in how their manufacturing operations may be improved. This seems to be a one-sided view of the merchandising question for one logical way to increase sales is so to improve and organize the production of furniture that costs are reduced and prices lowered. Be that as it may, the goal of increased sales can be reached by participation in a broad far-reaching co-operative scheme having as its object the raising of the standard of Canadian homes.

Real Appeal of Furniture

Someone might ask, why should the furniture manufacturer give time, thought and money in an effort to arouse greater interest in furniture when the retailer is the one who will derive the greatest benefit from such a move? The real appeal of furniture is not its utility, for a person could eat as well from a plain kitchen table as from the most stylish period dining table, but it is a combination of beauty, proportion, comfort and convenience. A better furnished home is the ideal toward which every buyer of furniture is striving either consciously or unconsciously. The trouble in the past, and even today, is that the majority of those who buy a piece of furniture do not recognize this as the goal toward which they are working. The same may be said of the retail furniture dealer. When a retailer makes a sale he is selling a better-furnished home, but like his customer, does not realize this fact and as a result has not grasped its full significance. It remains for the maker of furniture, that far-sighted, practical individual, who has a breadth of vision which enables him to see beyond the confines of his factory, beyond the mere selling of his product, into the homes of the citizens of Canada and which has forced upon him the realization that upon him devolves the duty of raising the standard of Canadian life and Canadian homes to attempt a general educational movement upon a comprehensive scale. His reward will be the satisfaction to be derived from the rendering of a service which tends to elevate and improve Canadian homes and Canadian home life and from an enlarged and extended market for his ware.

How Idea Could Be Developed

It might be of interest to outline briefly a few of the features which could be included in the program for the coming year, taking it for granted, of course, that the activities of the Home Furnishings Bureau are to be continued and even extended. The backbone of any general educational publicity campaign is the advertising which is carried in the magazines and newspapers. The ideal scheme would include a continuous drive from January 1st, 1922, to the end of the year and then on indefinitely. However, this will have to be modified in accordance with the funds at the disposal of the Bureau. In any event a spring and fall advertising campaign should be ensured, the former to be conducted during March, April and May, the latter to run during October, November and December.

Apart from this phase of the work there are numerous other channels in which the Bureau should function. Every week, in fact every day should witness some definite activity in favor of better furnished homes. Special "Better Furnished Homes Weeks" could be organized in various centres. Educational work might be undertaken in schools and with teachers, among retail furniture dealers and their sales forces. The representatives of the furniture manufacturers could also be assisted and instructed. Educational articles on furniture, furnishings, color schemes and decorative effects should be secured and given to the newspapers and magazines for publication. Illustrated lectures could be prepared or secured and made available for women's clubs and various societies and organizations which would be glad to take advantage of such material. An attractive booklet should be prepared for free distribution to those interested, showing desirable interiors, color schemes and containing information and suggestions which would be of assistance to those who are striving to make their homes more attractive.

Improvement of Home Sole Objective

The whole scheme should be developed primarily with the sole purpose of improving the standard of Canadian homes instead of attempting to push the sales of furniture. The result will be the same in either case—more furniture will be sold—but it will have been accomplished in a dignified manner as befits the great furniture industry. A discussion of homes invariably leads to a discussion of furniture. Better furnished homes means better furniture. The two are inseparable. As the desire is created for a comfortable, tasteful, better-furnished home, a new market has been made for the output of Canadian furniture plants.

There is a common belief to the effect that a person, manufacturing organization or even an industry either goes forward or slides backward. There is

no middle course, no standing still. What is the furniture industry going to do during 1922? Is it going to go forward or is it going to slip backward? Is it going to forget the vision it has had during the last few years, overlook the favorable impression which has been made by its publicity efforts, ignore the fact that furniture sales can be increased, perhaps doubled, by intelligent, aggressive effort, and rest on its oars, or is it as a unit, supported by every individual manufacturer, going to inaugurate and support a far-reaching campaign which will assist in raising the furniture manufacturing industry to where it belongs and make Canada a country of better-furnished homes? The answer rests with each manufacturer as an individual. The Home Furnishings Bureau is helpless without your support and co-operation. It is yours to withold it or give it. In the November "Canadian Woodworker and Furniture Manufacturer" the question,—"Is 1922 to be a furniture year?" was asked. What is your answer?

What are the Small Leaks Costing You?

Little Losses Which Pass Unnoticed Take High Toll—Lumber Wastage Reduced Through Closer Attention to Detail—Every Phase of Work Should be Studied

By WM. SNAITH, C. E., Associate Engineer with Forest Products Engineering Co., Chicago.

We've all laughed at the man who didn't fix up his leaky roof because he couldn't do it when it rained and didn't need to do it when it was fine. He must have lived a long time ago and left numerous decendants who have become manufacturers. They are too busy in good times to make improvements and in bad times they don't need them. The time to stop leaks is all the time. When business is good the proverbial rainy day should not be forgotten and when business is bad it is sometimes possible by stopping the leaks to make profits as large as in boom times, Prosperity breeds bad habits and waste. Hard times teach thrift.

The waste of labor and material in many plants if it could be reduced by half, would likely be sufficient to cover all the overhead. Andrew Carnegie succeeded in the steel business because he was a champion "scrapper" in two senses, but the most important of the two was that he never hesitated to scrap a machine if a better was invented. There are woodworking plants where enough labor is wasted trying to make out-of-date equipment work, to cover the cost of new equipment inside of a year. Some plants with new machinery operate at a fraction of its capacity.

Not Conspicuous

The trouble with such leaks is that they are not easily seen. If material worth a few hundred dollars is spoiled it occupies space and is very much in evidence. If a foreman has to spend half a day trying to make some old relic of a machine turn out work, his time is wasted and through lack of his supervision the labor of his department is to some extent misapplied. Or if he is called upon to spend much of his time at reports and clerical work, the duties he should be attending to must inevitably suffer and result in loss of labor. When methods are not standardized and a workman has to learn where to find fixtures and tools, where to go for this, that and the other thing, the manufacturer pays for this training and losses all it cost him when the man quits and a large part of it if the man is promoted or moved to another job. Leaks of this kind can go on for years and be looked on as inevitable—necessary evils. most of them can be avoided by right methods.

The loss of lumber through wrong methods of drying would run into an impressive total if it could be measured. There are kilns in use in many plants which violate nearly every scientific principle of drying; there are others which produce more or less satisfactory results at times and ruin the lumber at others. It is one thing to dry lumber which has air-dried for months and another to dry green stock. A kiln may be able to do the one and fail entirely to do the other. The operator may lack knowledge of the principles involved and still produce suprisingly good results within narrow limits by rule-of-thumb methods. Outside of these limits the results may be equally surprising as also the resultant losses. Even with modern kilns inexpert operation can injure the lumber. Much has been written on this subject but apparently most of it fails to reach the practical men who are entrusted with the most important single operation in woodworking. A man handling a fair-sized battery of kilns of modern type could easily earn a salary of several thousand dollars a year in the fuel he could save and the lumber he could prevent being spoiled or damaged. It is an error of considerable magnitude to entrust this work to anyone but a man of skill and experience, preferably with technical training in kiln work.

Handling and Piling Losses

Even before the lumber reaches the kiln losses are sustained by improper piling in the yard. The piling of lumber, size and spacing of stickers, pile foundations and the such like are nowadays beginning to get a little of the attention they deserve. When the information on these matters in the technical journals reaches the practical men in the lumber yard and they begin to take it seriously a large sized leak will start to close up.

Inside the plant there are few operations which cannot be improved. Waste motions abound. The bandsawyers marker goes on counting pieces before nailing them together, ignoring the fact that the nails automatically count the pieces. The placing of trucks with relation to machines can affect producton to the tune of 10% and make all the difference in the world to the operator in the matter of fatigue. There are operators who have worn tracks into hardwood floors with steps which need never have been taken.

Systematize Inside Work

In trucking and handling quite respectable sums can be saved in the course of a year. Well built trucks of the proper size and capacity are dividend payers. Rehandling from trucks to piles or bins and back again to truck is indulged in sometimes to such an extent that the cost would be impressive if it could be separated from the item "factory expense" into which it is lumped along with numerous other necessary evils.

The time spent on making out and punching time-cards runs away with a fair sized share of the time

between starting and quitting. If all the records so made out were perfectly reliable they might be worth what they cost. But when they show time taken actually half what the best man in the plant could do the job in, and another time three times, his confidence in their accuracy is somewhat shaken. At their best, cost records only show past performance. Whether this represents a fair day's work or not the records can not indicate. The pace being steady or the performance consistent can not be taken as indicating that the limit is even nearly reached.

The advent of the engineer into the woodworking field is revealing many of the leaks and as rapidly finding ways of stoppng them. The egineer is no respecter of old age in methods, machines or practice. He is an ultra-modernist when ways of doing things are concerned. So much more can be accomplished with carefully directed energy than by the hit-or-miss method, that it pays to bring trained minds to the study of even simple operations. The engineer is not a salesman pushing some particular kiln or machine and can give unbiased advice about all of them. In many cases improved methods of using existing equipment prevent the necessity of purchasing new. In other relatively new equipment may be profitably scrapped for still newer.

The discussion of leaks and ways of closing them would be incomplete if the human factor were left out. The workmen are the agencies by which in the last analysis all the stopping is to be accomplished. The workers must be provided with an incentive to make it worth while for them to increase production or improve quality. The foreman must find that increased efficiency in his department results in increased pay. Both these matters have been treated in a previous article.

Leaks of different sizes exist in all plants. Some are known and recognized for what they are and some are hidden. They cannot all be stopped at once and while some holes are being plugged others grow larger. The more attention the leaks get the more profits there are in the business.

January Furniture Exhibitions

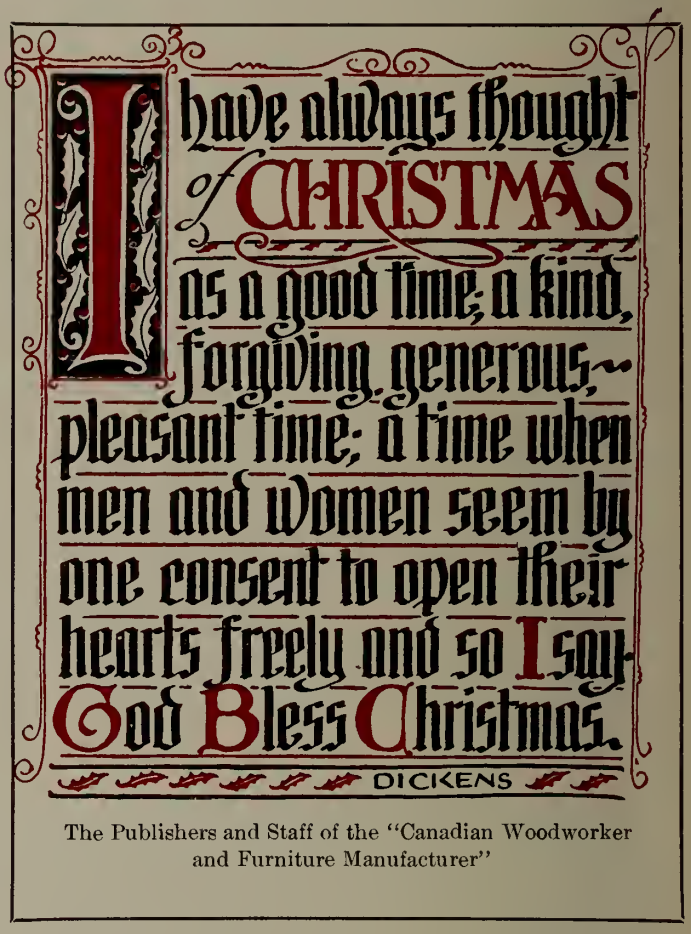
The furniture manufacturers of Ontario are busily engaged at the present time in bringing out new samples and in making plans for the furniture exhibitions which are to be held January 9-21. As heretofore, these displays will be made at Toronto, Kitchener and Stratford.

The Toronto exhibition is to be held in the new live stock arena building at the Canadian National Exhibition. Here 125,000 square feet of floor space are at the disposal of the furniture manufacturers. Owing to the delay in securing these premises a number of the furniture makers who have been in the habit of displaying at Toronto have made plans to go to one of the other centres. Their places are being taken by other representative furniture men, so that the show at Toronto will be up to the usual standard.

The Stratford manufacturers are making their displays in their home town, as usual. In addition, several outside manufacturers have decided to show in Stratford. It is anticipated that the furniture exhibitions in this centre will be on a more pretentious scale than on former occasions.

Not to be outdone, the Kitchener-Waterloo furniture men, aided by a number of outside manufacturers, are striving to make Kitchener the centre of attraction during the market period. Not only have arrangements been made for a large number of attractive displays, but preparations on an extensive scale have been perfected for the convenience and entertainment of visiting furniture buyers. As one Kitchener manufacturer has put it, "there will be something doing all the time."

It is expected that the retail men will attend these exhibitions in force. Business in the retail end of the industry has been good and at the present time stocks on the floors of the various dealers are well below normal. It is, therefore, confidently expected that a gratifying volume of business will be booked, sufficient to keep the furniture industry going for the winter months, at least. Many new and attractive designs will be shown and while prices have been figured down to the last notch, it is anticipated that the price tendency will be higher. This is accounted for by the fact that such woods as gum, walnut and oak have advanced during the last two months and that there has been a big advance in glass with another one expected early in the year. This latter fact will have a marked effect on the cost of goods into which glass enters. There may be a re-adjustment downwards on certain items, but on the whole the tendency will be upward. This in itself should have a stimulating effect on business for it should tend to convince the furniture dealers that prices have touched bottom and are on the rebound.



The Publishers and Staff of the "Canadian Woodworker and Furniture Manufacturer"

A wood pulley is a balanced pulley, which is a big consideration when the countershaft runs 1,000 revolutions per minute.

The Wisdom of the Wisemen

A Wood Turner's Christmas Carol

By WILLIAM BABBITT

MOTHER met me at the door last night, when I came home from the shop. A happy light was in her eyes, and on her cheeks the soft flush of joy. The news tumbled from her lips,—"Father, the boys are coming home for Christmas."..And suddenly there was with her a multitude of happy memories, as of an Heavenly Host, praising God. Like one of the spell-bound shepherds of the Judean Hills, I stood silent, wondering what these things might be. It was in such wise that a tired, dusty wood turner, worried and heavy laden, heard once more the far echoes of the Angels' song, and caught yet another gleam of "the light that never was on sea or land."

Under the evening lamp (the spell still upon me) I read again that story which ends with the visit of the Wisemen from the East. Somehow, I found myself strangely kin with these hardy adventurers after Truth,—who so superbly ventured, so greatly served, and so quickly and completely were lost in the World's heroic host of the unnamed and unknown. Here is a thumb-nail sketch of their story.

Their Journey:

Led by a Star, Wisemen came out of the mystic East to find the Babe of Bethlehem. Long, weary leagues they safely followed the Star.

Their Tragic Folly:

When they came near Jerusalem, they forsook the Star that had guided them, and asked the wise-acres of Jerusalem what to do and where to go. From their questions, Bloody Herod learned Whom they were seeking. The result was the slaughter of the innocents",—the murder of all the baby boys of Bethlehem.

Their Wisdom:

Quickly they returned to the guidance of the Star, which soon "stood over where the young Child lay." After doing homage to the young Child, "they opened up their treasures." Then they made haste and were gone.

Now do you wonder that I fell to asking myself whether or not these Wisemen were entitled to the name? Does not their folly bulk larger than their wisdom? If they were wise, why did they not stick to their proven Star for guidance? Why did they adventure into circumstances they did not understand, to make mistakes the effect of which they could not foresee? The echoes of the "Angels' song died away. Once more I was grappling with the hard realities of a hard day's work. Then came the clue to the mystery. The wisdom of the Wisemen is to be tested not by its quantity, but by its quality. Being human, they erred They did not have enough of any kind of wisdom to prevent blunders. But being "wise," they were where high service called them at the time they were needed. They had that quality of Wisdom by which all progress is won.

What Wisemen they were! They were men of vision. They dreamed dreams. They had faith. To them, the bloody reek of terror and darkness round about was not hopeless, but prophetic of better days and better men.

They were men of courage. Their lives were not ruled by the counsels of fear. They dared to put their vision to the test. The dangers and hardships of the long journey failed to daunt them. Forth they went into the Unknown, each alone; but each to find kindred souls who saw the same vision and dared the same quest.

They were men of purpose. They did not undertake danger for the love of the thrill and excitement of meeting great hazards. Nor did they shrink from danger. It was an incidental matter, of interest only as affecting their quest.

When the Wisemen came to their journey's end, they found their quest, Him "that was born King of the Jews," in circumstances so squalid and unseemly as to upset every reasonable anticipation. But they did not hesitate. Swiftly and competently they worked to their purpose. They rightly estimated the grim purpose back of Herod's courtesies, though they little guessed to what murderous limits his jealousy would go. "They opened up their treasures." In simple words, they provided money for the safe flight of the Mother and Child. They backed their judgment with their money. This is sound business for our day as well as theirs.

What a sound method of judgment and action the story reveals. It is not the method of timid "3 per cent and safety" conservatism. Still less is it the method of blue-sky investors. These are steps in their method: Vision, Courage, Investigation, Decision, Preparation, Action. There will be a percentage of failure. But any man who insists that before "action" shall go the five great pioneers of wisdom, will find eventually that his energies, his resources and his desires are bound up in the great enterprises of humanity, whose ultimate boon is "Peace on Earth to men of Good Will."

We must admit that there is another kind of wisdom, the gray-bearded wisdom of the past. This wisdom needs no vision, because the sum of all wisdom is in the sayings of the dead. It chooses the old paths. It needs no courage, because it has no adventures into the Unknown. This wisdom looks for light where the sun has gone down. It is the ancestral wisdom of China and India. But it is not the wisdom of wisemen,—of the star-led. It is not the wisdom of PROGRESS, greatly conceived and greatly attempted.

Our task to-day is to reconstruct the fabric and constitution of industry to meet the demands of the New Era. Many there be who will attempt this mighty task by the light of the sun that has gone down. They will say we must seek the old paths, the old levels of business, the old systems that worked so well in an age that is dead. But we know full well that the precedents of yester-year will not avail for this new adventure. Of small value is the wisdom of Solomon for our enterprise. Our vast and solemn undertaking shall be accomplished only by a Wisdom whose Vision pierces the Unknown, whose Courage dares to test that Vision's truth, and whose Will is steadfast 'till the quest is found. Our need is the Wisdom of the Wisemen.

Thus it happens that as a humble wood turner

takes up his woodland harp to strike the dominant chords of the Carol of the Wisemen, he hears not only the great major chords of struggle and victory and peace, but also the throbbing minor of pain and loss; "Rachel weeping for her children because they are not." Not from the shelter of the tombs, but from the vast unknown, the voice of Wisdom cries. The quest is not some long lost Age of Gold, but this Age of Ours, foretold by all the hopes and longings of the sons of men.

It is not told of the Wisemen by what path they came, or at what cost; or whither they went. It is told however that as they journeyed folly stalked at their heels. But despite of all, and Rachel's tears, they won their quest. It is not told by what path we must go, or at what cost. But so it must be, methinks, with all who follow the star-blazed trail.

Spiritual Values in Industry

Character and Moral Fibre More Important Than Factory Equipment and Raw Material—Industrial Problems Cannot be Settled by Force or by Legislation

By ROGER W. BABSON

The old method of teaching economics was that everything comes from "land and labor." Many courses are now being taught in our colleges to-day along those lines. Statistics, however, clearly show that this is a fallacy. For instance, China has greater natural resources and more available labor than this country and yet it is away behind this country. Natural resources, available labor and capital are important, but these things are of little value until they are released by people filled with the spirit of God. That is what the study of economic history clearly teaches.

It is very important for everybody to see that their sons and daughters realize that the old system of economics is false because it omits the most important factor of all, namely, the spiritual values. As Towson says, "Materials, labor, plants, markets, all these things can be adjusted, but the soul of man, which determines his purposes and his motives, can only be converted through religion."

Printing was discovered in China several thousand years ago, but it began to be developed only three or four centuries ago in Europe for the spreading of the teachings of the Bible. It was the desire to propagate the teachings of Jesus which developed printing. Religion has been the spiritual force which has developed not only our nation politically, but commercially and industrially as well. Economic history teaches one thing very plainly: the industrial problem will never be solved by employers' associations, or labor associations, or consumers' associations, but only as all get together as brothers filled with the spirit of God. If I learned one thing during the two years when serving Secretary of Labor Wilson, in Washington, it was that these problems can never be settled by force or by legislation.

Our troubles to-day are very largely due to the fact that we have been trying to run industry by the will of Congress instead of the will of God. The trouble with bankers to-day is that they are looking too much to Dun's ratings and Bradstreet's ratings and too little to God's ratings of men. Some one asked me recently the difference between ethics and religion. I replied, "Ethics is the track of the railroad system; religion is the motive power. Ethics is the wheels of the watch; religion is the spring of the watch."

When industry started in this country, we built a foundation for a two-story building. We have been adding additional stories to this building until we have an eight or ten-story building with the same spiritual foundation. The great task before industry to-day is to quit adding more stories to the structure and to strengthen the spiritual foundation underlying that structure, without which there can be no structure at all. This is not mere theory; it is very evident in all lines of work. Take any industry for instance. What is the most important asset—the physical property or the management? Any banker will tell you that it is the management. What is the most important asset to a corrporation from a business point of view—a great mass of buildings, or a God-fearing board of directors? The answer is obvious.

I am speaking as a statistician, not as a preacher. Our political freedom, our personal safety, our educational system, our work to relieve suffering, our industry and commerce—everything that is worth while to civilization—we owe to those spiritual qualities which teach man to serve.

The Indian did not care to construct a log canoe because he knew it would be stolen from him. He did not catch more game than he and his family could consume in a day because it would be carried away by others. But as soon as integrity was taught by the missionaries, the Indians began to construct their canoes which might perhaps be suggested as the beginning of our merchant marine. The Indians then began to preserve their game and that was the forerunner of the packing-house industry. Business enterprise is possible only when moral integrity obtains. Business enterprise and civilization itself are the products of spiritual teachings.

The difference between barbarism and civilization is a difference in the spiritual element. Even when civilization gets to a certain point, as we have it now, it can remain steadfast only as we pour religion into it. Civilization makes no progress until spirituality makes a jump and then civilization moves to catch up. That is what the labor situation is waiting to do. When there is an increase of spirituality among all groups, then there will be another great development in the labor movement, but not until then. No reforms can be forced through and be permanent. We can develop only as we co-operate with the spirit of God. Oh, if men would think more of religion and less of commodities, bank clearings, foreign trade and immigration! When they do we shall again have prosperity. Moreover, the present depression must last until this change comes about!

Exhaust Systems for Woodworking Plants

Size of Collector Important Factor—Stream-line Hood Design Does Not Retard Flow of Air—Floor Sweeps are Convenient and Often Necessary

By H. M. NICHOLS, B. F. Sturtevant Company, Boston.

(Continued from November Issue)

The resistance of a round pipe to the flow of air is inversely proportional to the fifth power of the diameter of the pipe. Therefore, handling a given quantity of air through a larger pipe at a lower velocity decreases the frictional resistance very materially and correspondingly decreases the horse power required at the fan and thus it is very desirable to keep the air velocities througout the system as low as possible, consistent with the major requirement that the refuse must be taken away as fast as made, without clogging the pipes, under the varying operating conditions met with from day to day in the mill.

After the size of the main trunk is fixed an exhaust fan should be chosen with an inlet at least as large as

Shavings exhaust installation in furniture factory. Note large double fan in top centre

the main pipe to which it is connected. If low power consumption is essential use a larger fan having 25 to 50 per cent greater inlet area. The discharge pipe leading from the fan outlet to the collector is usually made the same diameter as the main suction pipe.

Make Collector of Ample Size

The dust collector should be of ample size for the system. The larger it is, up to reasonable limits, the better will be the separation, the less will be the back pressure, and the less will be the power required. It has been the custom to use a collector whose nominal size is equal to the diameter of the pipe leading to it, but this is not good practice unless consideration is given to the proportions and general dimensions of the collector, since some makes are smaller than others for a given size number.

The suction required at the hoods varies from 1½ to 5 inches of water, depending upon many factors, such as the relative size of the hoods, condition of the material handled, etc. The volume of air required, resistance of the system, speed and horsepower of the fan is most easily determined by use of engineering formulas and tables for friction loss in pipes, flow of air for various pressures, etc.

The design and construction of the hoods is extremely important since they are required to guide the chips and refuse into the suction pipes and prevent them from falling back into the cutters or flying out into the room. Improper hoods are not always the fault of the blowpipe men as some machines will be found with old style chip breakers to which proper hoods cannot be applied.

Suggestions for Hood Design

In designing hoods, a principle to keep in mind is to shape them so there will be no eddy currents at the inlet. This can be accomplished by laying them out with the so called "stream line" effect, i. e. the sides of hoods should taper gradually to the pipes and also all abrupt bends within the hoods should be avoided. Particular care must be taken to shape the hoods so that the action of the cutters will assist the exhaust system by discharging the refuse in the direction of the flow of air and toward the throat of the hoods. To be most effective, they should fit the cutter bonds as snugly as possible, without interfering with the operation of the machine. The hoods must also be arranged so that they can be quickly swung out of the way for adjustment of the cutters.

All top and side head hoods require telescope or slip joints, for convenience in changing the cutters. The outside pipe of the slip joint should be heavily re-inforced at the bottom with a steel band or malleable iron casting. Movable head connections should be provided with cast iron ball points in order that the heads may follow the cutters to any position without

Shavings exhaust from large moulder, with floor sweep in foreground

interfering with the operation of the machine or lessening the suction.

For most conditions, hoods are constructed of galvanized sheet iron, the gauge of which, depending upon the strength and stiffness needed, should never be lighter than No. 22. Top and side heads to matchers and moulders, planers, and other heavy machines are usually made of No. 16 or No. 18 iron and for the lighter work 18 to 20 gauge is often used. The exposed edges of all sheet metal hoods should be bound with wire or band iron, not only to give the necessary stiffness, but also to prevent the operator being cut by the raw edges of the sheets.

Use of Floor Sweeps

With some types of wood-working machines it is impracticable to hood the cutters in sufficiently to catch all the refuse thrown off, and in such cases floor sweeps are placed near them. Also combination floor sweeps should be attached to the bottom heads of moulders and similar machines. The floor sweeps should be arranged so that all the material passing through them will be lifted from the floor by suction, thereby avoiding the possibility of large blocks and slivers being swept into them. They should also be equipped with tight fitting dampers or blast gates.

The conveyor pipes leading from the hoods to the fan and thence to the collector are commonly made of galvanized iron, the gauge of which varies from No. 24 to No. 14 depending upon the diameter. The piping must be free from dents, fins and projections of all kinds on which shavings and wood slivers might catch. All permanent circular joints should be lap-jointed, riveted and soldered, and all longitudinal joints either grooved and locked or riveted and soldered. Circular laps should be in the direction of the flow, and piping installed out-of-doors should have the longitudinal laps at the bottom.

All pipes passing through roofs require aprons to prevent water leaking into the building.

Straight Lines Desirable

The main trunks and branch pipes should be as short and straight as possible, strongly supported, and have the dead ends capped to permit inspection and cleaning. All branch pipes should join the main at an acute angle. The junctions being at the side or top and never at the bottom of the main. Neither should two branches be placed directly opposite each other. Dampers of blast gates should be installed in each branch pipe.

Cleanout openings having suitable covers should be placed in the main suction and discharge pipes as well as in the branches leading from the machines. Either a large cleanout door should be placed in the main suction pipe near the fan inlet or a detachable section of pipe, held in place by lug bands, should be provided. In some cases, where the piping passes through a firewall, it is desirable to install an automatic fire damper.

Elbows are usually made two gauges heavier than straight pipe of the same diameter, the better to enable them to withstand the additional wear caused by changing the direction of flow. They should preferably have a radius of at least 1½ times the diameter of the pipe.

The attention given to drying, before and after laying, determines to a large extent the success of the veneering operation.

Furniture Manufacturer at Ottawa

When the Dominion Parliament assembles at Ottawa, the furniture industry will have a capable representative in the person of James Malcolm, of Kincardine, Ont.

Mr. Malcolm was returned victor over Hugh Clark at the recent election by a good majority. This victory puts the Malcolm family in the ascendancy. In 1902 Andrew Malcolm, father of the present member-elect, was defeated by Col. Hugh Clark, father of the defeated candidate, by the narrow majority of five votes. Col. Clark was unseated on a petition but was returned later in a by-election with forty-four of a majority. In the recent federal contest the Malcolm family came out on top.

James Malcolm of the Andrew Malcolm Furniture Co., Limited, Kincardine and Listowel

James Malcolm is too well known to readers of the "Canadian Woodworker" to need any extended introduction. He is one of the younger school of furniture manufacturers and is actively connected with the Andrew Malcolm Furniture Co., Limited, of Kincardine and Listowel, and Malcolm and Hill, Limited, Kitchener, Ont.

Manufacturers to Tour West Indies

The Canadian Manufacturers' Association are attempting to organize a tour of the West Indies. The plan is to have about twenty-five representative Canadian manufacturers visit the various centres of the West Indies, to secure first-hand information as to the requirements of that market and to cement the business bonds which are gradually bringing Canada and the West Indies into a closer union. If suitable arrangements can be completed this tour will be undertaken early in the year. It is probable that several furniture men will take the trip provided the dates do not conflict with those of the furniture exhibitions.

Organizing the Woodworking Plant

Are You Successful in Training Executives?—Importance of Building Goodwill and Confidence—Give Preference to Men in Your Own Organization When Filling Vacancies

By W. WARREN

I do not possess any special knowledge or formula for organization. However, had I to again assemble an executive staff I would adopt similar methods to those which I have been employing.

To successfully carry on a woodworking business a manager must be ably supported by lieutenants or key-men. These men must be loyal to him and the same trust be reciprocated by the manager. It is, of course, presumed that a thorough understanding exists between the firm and manager, and if such is the case, the spirit of trust and good will can then be traced to the remotest parts of the organization; distrust, sedition, dissatisfaction and all other unhealthy conditions will then be conspicuous by their absence.

In selecting men, the principal qualification should be healthy men, clean in body and mind. A technical and scientific knowledge is a big asset, if accompanied with the former attributes, but if the whole combination is not obtainable, then the latter can be dispensed with, and preference given to the clean body and clean mind. Knowledge pertaining to the business will be the natural outcome when a man with strong moral fibre becomes firmly planted in a healthy business environment. Select men then that need only to be taught the business, good men who are already conversant with honor and honesty; the outcome will be buoyancy, optimism, enthusiasm and these qualifications will be transmitted to the remotest part of the organization.

Do not Fear Those Under You

No manager can build up an organization unless himself is held in high esteem by those around him. He must be truthful and impartial, sound in judgment and strict in morals, and if in possession of these virtues, will experience no trouble in rounding out his organization with suitable men.

There is, without doubt a serious shortage of men capable and willing to qualify for executive positions. This dearth of men has been brought about from various causes, one of the principal of which is an unwillingness on the part of those higher up to perpetuate their profession by handing on any knowledge they might possess to an apprentice or understudy. Quite frequently one comes in contact with an individual, who fondly imagines that to pass on any information, will enable these following to become contestants for his position. A man so constituted is selfish, living entirely for the present, all unmindful of the future. He is a misfit of no commercial value, and will prove a bill of expense to his employers, retarding progress and will contaminate any organization with which he happens to be associated. Employ only those men whose slogan is progress and expansion. A man who really loves his work or profession desires to perpetuate his calling, knowing that in trying to improve his understudies he is solidifying his own position and maintaining a lead that can only be assured in this way. He is elevating the standard of his profession.

Work Should go on the Same

It matters not what our position may be. We should at all times arrange our work so that in case of enforced absence, it will still go on without friction or loss. Our work may run with clocklike precision when we are present, but unless it functions just as satisfactorily when we are absent, then we are failures and certainly lack organizing ability. We do not pay sufficient attention to the selection and training of new men, nor do the beginners give enough serious thought to their calling.

Our managers, superintendents, foremen, etc., should, if possible, be selected from the rank and file, in preference to the importation of strangers. This inspires confidence and creates competition. It is, therefore, of the utmost importance that a supply of healthy, intelligent, enthusiastic men be continually in the making.

The human element is a tremendous factor in the lumber and woodworking business. We would not think of attempting to carry on without provision for future requirements of lumber. In this we are continually looking ahead, yet we make very little provision for our future labor needs.

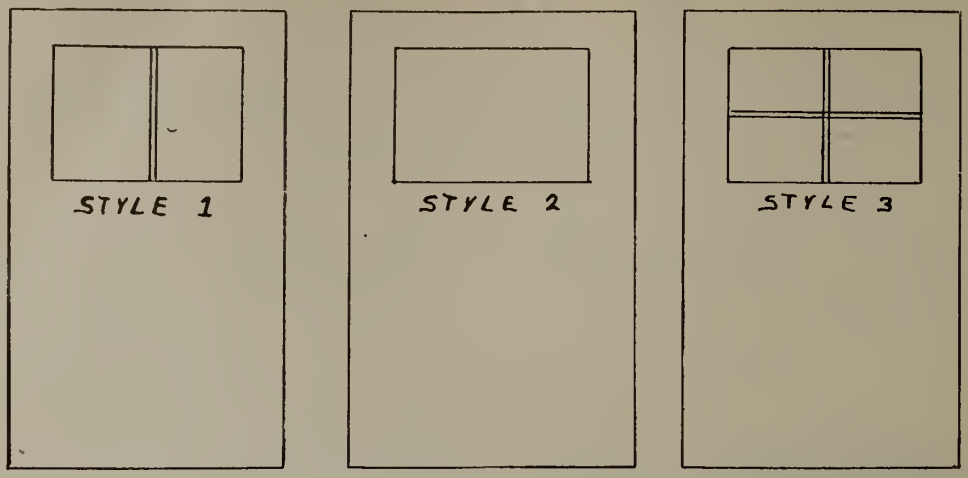
Importance of Efficient Staff

Our finished products are composed of two things, labor and material. In estimating or establishing the selling price of our goods, we must consider both factors. We can easily estimate the material because it possesses a definite value at point of destination, but here the labor with all its uncertainties steps in and the efficiency or non-efficiency of the organization will decide whether or not our transactions shall be profitable. The difference in the cost of handling can and does very often fluctuate 50% according to the efficiency or inefficiency of the methods employed. It will be seen from this how uncertain any labor estimate is. The remedy seems to me to be just this—Create a feeling of loyal, cheerful enthusiasm amongst the executives, and let it be generally known that work well and efficiently performed will not go unnoticed or unrewarded. This feeling will then be transmitted to the rank and file, and will reach the remotest operation and in turn reduce handling and manufacturing costs to a minimum. It will not only remove uncertainties, but it will tend to keep the workman's interest centered on his work on the exclusion of extreme views, antagonistic to his employer and harmful to himself.

It is of the utmost importance that the management keep in close and constant touch with the executives, but having given a man a definite piece of work, let him complete it. Do not under any consideration do it for him. Watch him closely and trust him fully, bring out originality and inventive.

These remarks may sound utopian and chimerical, but if put into practical use, will create a recruiting ground capable of supplying a man for every position in the woodworking business and efficiency will then be emblazoned on all our actions.

It is said that the furniture trade is now beginning to make some headway in the right direction.



Labor and material costs on 11 slab doors in Quartered White Oak, 1¾" thick, fitted with stops, as follows:—4 style 1 3 ft. 6 in. x 7 ft. x 1¾ in. 3 style 1 2 ft. 6 in. x 7ft. x 1¾ in. 2 style 2 3 ft. x 7 ft. x 1¾ in 2 style 3 2 ft. 10 in. x 7 ft. x 1¾ in.

Would You Make These Doors For $325.00?

Is it Probable that Costs Would Vary 45 per cent in Different Plants?—Check over Your Figures on These Doors and Compare With Actual Costs Given Herewith

The articles on "Cost," which have been a feature of recent issues of the "Canadian Woodworker and Furniture Manufacturer," have been the means of arousing a considerable amount of interest in this important subject. Too much emphasis can not be laid on the importance of accurate cost knowledge and the active support of every member of the woodworking industry should be given to any movement having for its object the elimination of guesswork in quoting on wood products. If you receive a request from the "Canadian Woodworker" for an estimate on some simple job, do not put it to one side, but send your figures in promptly.----The Editor.

Is the basis on which your estimates are figured an accurate one? Do you keep records of work done to serve as a guide in giving quotations? Do you know whether you make or lose money on every job turned out and how much? Unless the above queries can be answered in the affirmative, your business is not being conducted along sound economic lines.

Here is a test. Estimate the labor, both bench and machine, and material required to supply the doors shown in the accompanying sketch and compare the results with the actual cost figures given herewith. These doors were made by a well-known Canadian woodworking house and accurate records were kept of both time and material. As the equipment and methods employed in different plants vary, there is bound to be a slight variation in costs and estimates but such differences should not be very marked, roughly not over five to ten per cent.

For comparison purposes the "Canadian Woodworker" asked a number of manufacturers who are specially equipped for work of this kind, to submit estimates. The response to this request was gratifying. The following is a list of the quotations received. These figures are cost only, including overhead, and do not make any allowance for profit.

Quotation No.	Material	Bench Hours	Machine Hours	Total
1A	150.65	110	30	**393.80**
1				$316.00
2	$89.13	87	63	311.35
3	96.60	66	54	307.60
4	111.64	49	74	297.15
5	**94.83**	**78**	**57**	**281.65**
6	123.70	82	41	276.00
7	87.60	58	39	234.00
8	92.00	71	48	226.75
9	98.45	40	21	202.15
10	106.30	52	28	191.00
11	79.91	38½	27½	173.57

A glance at these figures shows that while several estimates are within striking distance of the real cost, No. 5, $281.65, yet there is a conspicuous lack of uniformity as to cost of material, hours of bench and machine work required and finally as to the total cost. The actual cost figures, which go to make up quotation No. 5, are as follows:—

Material:—

474 feet pine	$50.00	$23.70
28 feet Q. W. Oak	250.00	7.00
474 feet Q. W. Veneers	75.00	35.55
120 lin. feet stop.	1	1.20
		67.45
Plus 40 per cent waste allowance		27.38
Total Material		$94.83

Labor:—

Machine	56.45 hrs.	$1.20	68.10
Bench	78.25 hrs.	.90	70.58
Helper	2.0 hrs.	.60	1.20
Total Labor			$139.88

Material plus labor	$234.71
20 per cent commercial burden	46.94
Total Cost	$281.65
Add 15 per cent profit (nominal)	42.24
Selling price	$323.89

The total number of hours as shown in this cost is 135. One of the estimates submitted gave 61 hours as the required time and another 66, less than half in each case. In order to check the accuracy of the original figure the "Canadian Woodworker" compared the time with other jobs of a similar nature and found that it was substantially in agreement. The question that arises is then, if 135 hours is approximately correct, have the manufacturers who submitted 61 and 64 hours underestimated the labor? In other words, is the basis upon which they estimate inaccurate? A difference in equipment and plant organization might account for some variation, but it is difficult to conceive of the difference being over 50 per cent.

The Question of Waste Allowance

One concern figures the material as being worth $79.91, another $123.70, a third $111.64, while in the cost it is shown as $94.83. Why the difference? It is not likely that there would be any variation in feetage, for it is the simplest matter to take off quantities on a job of this kind. It means that each manufacturer puts a different value on his material and probably makes a different waste allowance. No uniformity. In quotation No. 9 the waste allowance is shown at ten per cent, in No. 11 at fifty on veneers and twenty-five on cores, in No. 4 at fifty per cent and in No. 5 (actual cost) at forty per cent. It is probable that those who allow from forty to sixty per cent waste on work of this kind are safe, but there is no doubt that ten per cent is away too low, and it is doubtful if twenty-five per cent allowance on the core is sufficiently high. There is a heavy jointing loss in building up a core of this kind, in addition to the usual trimming and ripping waste. Many woodworkers claim that a job of this kind should carry at least fifty per cent waste allowance.

The firm sending in the quotation for $316, intimated that their estimate would be found high for their policy was "quality first and at any cost." They d'd not come out so far at that. At any rate they are on the safe side, which should be a source of satisfaction. Would No. 8 at $226.75, No. 9 at $202.15, No. 10, at $191.00 and No. 11 at $173.57, make or lose on this transaction if some such nominal profit as fifteen per cent was added?

The Treatment of Depreciation in Production

Considered in Adjusting Fire Losses—Should Rate Vary During Periods of High and Low Production—Question of Replacing Woodworking Equipment Before it is Worn Out

By E. W. McCULLOUGH, Manager, Fabricated Production Department, Chamber of Commerce, Wash.

A factor reducing the loss is the depreciation existing at the time the loss occurs, in the determining of which depreciation enter such elements as the age of equipment, remaining useful life, whether the equipmetn has been handled carefully or otherwise, whether adequately repaired and renewed, whether driven to the limit or used within bounds, the location of the property, improvements in the art, local conditions and the status of the industry.

Evidence of depreciation is sought by direct, first-hand inspection and examination of the property, where that is possible. A thorough examination is made and a specific value and cost of repair are determined from the actual condition in which it is found. In any case, however, the depreciation written off on the books of the assured has a direct bearing and it is given the same consideration and weight as would be given to any representation made in good faith.

Depreciation taken on the books of the company is however, neither final nor binding upon assured or insurer. It is recognized that depreciation may be excessively or inadequately provided for, and book depreciation will be increased or decreased as the circumstances warrant. In no event do insurance companies attempt to limit the value of property at the time of a fire to the amount at which it is carried on the books of the company.

There is a general understanding on the part of fire insurance companies that as a matter of financial policy depreciation may be written off excessively or inadequately. There is on the other hand only slight recognition of the fact that obsolescence, physical deterioration and the other contingencies limiting the useful life of property may not at a given time correspond with the depreciation provided for by the accountant's regular fixed charges for those items.

It accordingly appears desirable that there be more extensive recognition of the distinction between the accountant's depreciation and depreciation for insurance purposes.

Adjusting Depreciation to Production

What can be done in a period of slow business recovery to ease the burden of fixed charges, particularly that arising from depreciation? The depreciation charge cannot be abandoned simply because profits are non-existent, for depreciation accrues whether or not there is a dollar of profit. But is the full normal charge for depreciation any more justified in a period of half-time production? Obsolescence is supposed to develop whether the plant is idle or running, but even this has been questioned. The difficulty of getting new capital in a period of depreciation alone thwarts the introduction and development of improvements, and concerns struggle on with equipment that might otherwise be scrapped.

Even granting the presence of obsolescence, wear and tear are ordinarly less when a plant is running half of its accustomed capacity. During war-time production equipment was operated at pressure far above normal, entailing extraordinary wear and tear, to compensate which an extra allowance for depreciation was recognized as necessary.

If this was so, if excess operation meant excess depreciation, is not the converse true? Does not light operation warrant a scaling of depreciation? Are

manufacturers not justified in minimizing their losses by adjusting depreciation charges to the flow of depreciation? Fifty per cent production does not warrant the abandonment of depreciation charges or even at 50 per cent reduction, if obsolescence proceeds irrespective of production, but cannot a point be determined somewhere between 50 per cent and 100 per cent of the normal depreciation allowance which would correctly represent the situation of semi-normal production?

An illustration, supplied by a manufacturer of metal products, which indicates that an estimate of depreciation based on expected performance can become very exact. This company calculates its depreciation on Ford cars used by its salesmen at 2 cents a mile and reports that the last thirty cars sold, exchanged or scrapped showed an average depreciation of 1.9 cents per mile and that these thirty cars were operated between five and six hundred thousand miles in all.

The attuning of depreciation to the flow of production is thrown out for thought and discussion in a year of slackened production and demand, when the fixed expenses of operation fall particularly heavy upon the shoulders of business men.

Operating Department Can Aid

Depreciation is in part inescapable and in part unwarranted. Wear and tear cannot be entirely made good even by the best of care. An expanding business outgrows plant and equipment, new improvements send even functioning machinery to the scrap pile. That is all true, but carelessness unnecessarily curtails the useful life of assets. Thus a correspondent writes in to the Department:

it is in the hands of a careless operator it may be

"In the hands of some competent operators, for example, a band sawing machine may be just as good fifteen years after it is built, whereas if worn out in six or eight years."

This would indicate in the particular illustration at least a 50% margin of preventable depreciation.

Waste is rarely due to design; nearly always to carelessness. The proper and regular oiling of machinery, the adjustment of bearings, the proper conditioning of belts and a discriminating use of the hammer and monkey wrench, all aid equipment to render that service for which it is designed, while timely and careful repairing will save many a machine from the scrap pile. Require your operating department to eliminate unjustified depreciation.

A distinction is necessary between maintenance, the purpose of which is to keep property at its present general condition, and renewals and replacements, which ,tend to prolong the useful life of property since maintenance is met from current expenditures and renewals and replacements are charged against the depreciation reserve. Extreme cases of maintenance and renewals and replacements are easily enough classified. Thus, the repairing of a broken window-sash is maintenance, the laying of a new roof a renewal, but there are a host of border-line cases defying definite classification, and accountants as a practical proposition fall back upon an arbitrary sum above which it is a renewal, below which it is a repair. This standard should be kept low or it will result in charging capital outlays into current costs.

Obsolescence An Important Factor

The importance of obsolescence as it affects the useful life of property is not entirely appreciated. Before it wears out, property is generally replaced by something bigger and better. Give the modern business man a machine that will render better and cheaper service, and he will scrap his present equipment, even though the paint has not worn off.

In response to a request for the useful life of a woodworking machine, the following characteristic reply was received:

"We wish to advise that we buy the best and heaviest woodworking machinery built, and while we use this equipment hard, we keep our plant to date, and are constantly purchasing the latest equipment and replacing the old with same. Consequently we have never had a machine in our service long enough to wear it out or even to wear it to the point where we felt it was nearing its end, and consequently we are not in a position to state from actual experience the exact life of any piece of woodworking machinery suitable for our requirements."

The useful life of property is strictly limited by the law of the survival of the fittest. Machinery is replaced not because it has worn out, but because there is something in the market which will do the job better. In determining the useful life and rate of depreciation of machinery and equipment give this factor of obsolescence the consideration and allowance it deserves.

Avoid Rule-of-Thumb Rates

Depreciation is not complex, not simple, but the difficulty of the task of computing depreciation does not warrant the abandonment of it. There is altogether too much reliance on rule-of-thumb typical rates of depreciation,—2 or 3 per cent for buildings, 5 or 10 per cent for machinery, 20 per cent for trucks, etc.

The best judgment regarding depreciation would be only an approximation frequently belied by subsequent experience, but there is a difference between guessing and estimating. A guess cannot be justified. It is a hit or miss affair. An estimate of depreciation attempts to take in all the factors governing a given situation, to assign weights and importance to them, to rely upon past experience and actual inspection of property, to differentiate between the various kinds of machinery, buildings, etc., and to apply depreciation with reference to a particular asset or group of assets. The need of classifying property will be more fully discussed in connection with recording depreciation.

It should, moreover, be recognized that the depreciation experience of any one firm however large, is limited and should be supplemented and modified by the experience of the industry. Each industry, with the aid of its technical men, should establish for itself standard rates of depreciation, which rates should be set upon defined conditions and after agreement as to the line separating repairs from renewals. Tables of depreciation built up from group experience can be accepted as indicating the normal, customary and usual depreciation. They are, however, not designed to meet all contingencies or to take the place of private judgment. It is expected that adjustments of these normal rates either upward or downward will be made to suit the individual requirements. In the last analysis the individual must determine his own depreciation allowance.

(Concluded in January Issue)

Largest Hardwood Flooring Industry in British Empire

Canadian Manufacturer has Four Plants Devoted to Production of Hardwood Flooring—1,735,000 feet of Lumber Always on Wheels

It is doubtful if few, or any, not immediately connected with the firm of Seaman, Kent Co., Limited, Toronto, have any idea of the magnitude of the hardwood flooring operations conducted by this concern in the production of their well-known brand of hardwood flooring. Here we find four large plants devoted exclusively to manufacturing flooring, two in Ontario and one in Quebec, and the output of a fourth

Frank Kent, Managing Director,
Seaman, Kent Co., Limited, Toronto

plant at Midland, Ont., under contract. To put it into terms of consumption and production, these four plants daily cut up about 95,000 feet of 4/4 hardwood, producing in the neighborhood of 80,000 feet of finished product. More than that, this huge operation has been working at normal capacity all through the quiet period from which we are gradually emerging. It is said to be the largest hardwood flooring industry in the British Empire.

The Seaman, Kent Co. are too well-known to need any extended introducton. They are strong believers in advertising and have a publicity department which is on duty twenty-four hours a day. One finds their advertising in numerous well-known publications, in the daily newspapers, on billboards, in various depots and in unexpected places. A little over two years ago they had moving pictures taken, showing the different operations in the manufacture of flooring, from the felling of the tree to the laying and finishing of floors. These were exhibited the length and breadth of Canada and then taken to Europe. Another publicity stunt was the promotion of "Hardwood Floor-in Weeks," which were held in many centres and which aroused a considerable amount of interest.

This company was organized in 1899 with headquarters at Meaford, Ont., where the parent and largest plant is located. Here six hardwood flooring units are in operation, chiefly on maple. The output consists of 3/8 in., ½in., 13/16 in., and 1⅛ in. material, in the usual standard widths, and averages about 42, 000 feet of finished flooring per day.

At Meaford, which is located on the shores of Georgian Bay, there is a good harbor and ample docks to receive lumber by water. A large quantity of maple is received every year from Michigan and ports on the Georgian Bay. As an evidence of the company's capacity to handle lumber, a few weeks ago a cargo of 621,000 board feet of maple was unloaded in two days and a second cargo of the same quantity was unloaded more recently. The company's buildings at Meaford are constructed with the view to permanency, being built of cement brick, steel and wood. Heat, sanitary and other conditions have been carefully considered to provide every comfort for the men. A modern automatic Goldie & McCulloch engine of over 600 h.p. provides power for the main plant. A separate engine provides light and a third engine circulates heat through the dry kilns.

Oak Flooring Exclusively

At West Lorne is located their latest acquisition. This was formerly a wagon factory but has been converted into an efficient oak flooring plant, which is claimed to be the largest factory devoted to oak flooring in Canada. The layout of yard and factory is such that the stock progresses through the various operations with a minimum of handling. This plant specializes in oak flooring in red and white oaks. The product includes square edge stock and 3/8 and 13/16 tongued and grooved flooring.

Excellent trackage facilities are enjoyed, the tracks running through the lumber yard and then between the factory and warehouse. The transfer truck for the kiln cars is built to conform to the gauge of the railroad track, and travels back and forth on this line. Thus the tranfer car can be taken out into the yard and loaded direct from the lumber piles. At the present time a limited amount of storage space has been equipped with rails to hold loaded kiln trucks. As far as possible these are loaded directly from the incoming cars of lumber. Any surplus stock is piled in the yard on either side of the railroad track. The kiln truck storage space is being extended and will eventually be able to handle all the incoming lumber. The practice is to have a steady stream of lumber coming from the mills rather than attempt to accumulate a large reserve stock at the plant. The requirements of this operation are about 16,000 feet of oak a day.

Lumber Thoroughly Dried

The kilns, which are three in number, are of a progressive type, the material entering at one end and progressing through to the dry end. The capacity of each kiln is nineteen cars, each car holding 4000

Views showing the four factories operated by the Seaman, Kent Co., Limited, Toronto.

feet, so that the total capacity of the three kilns is 228,000 feet, with a daily output of 16,000 feet of dry lumber. The stock is first steamed and then dried at a temperature of 140 to 145 degrees. The humidity of the air drops as the lumber approaches the dry end. About seventeen days are required to bring the material down to the required degree of moisture content. Handling of the loaded cars in the kiln is facilitated by a winch which has been placed convenient to the dry end. A rope is passed under a row of cars and fastened to the last car; then the whole nineteen are moved forward the width of a car.

The kiln trucks, with the dry lumber, are rolled out into the plant and placed adjacent to the gang edger. As the name implies, this machine is equipped with a number of saws, eight, to be exact. The first three are set to cut 1¾ material; the next two spaced for 2-inch stock, while the last three take care of the strips for 1½ in. face flooring. The two outside series of saws are worked from the outside edges of the bed, moveable gauges being used when cutting 2-in. strips. As it works out in actual practice, many of the wider pieces are cut into 2-inch and 1¾-inch strips, the gauges being so manipulated that each board is ripped with a minimum of loss.

From the gang edger the strips go either direct to the hardwood flooring machines or to the resaw depending on whether 3/8 in. or 13/16 material is being run. The edgings are taken from the power-feed ripsaw and cut down for ¼ round and coves. Factory trucks handle the strips between these different machines.

Modern Equipment Used

A battery of four machines, three American hardwood flooring matchers and one "American" moulder, placed side by side, take care of the next operation. Three of these machines are kept continuously on flooring, while the moulder is used to run cove and ¼ round. Needless to say, these are equipped with all the latest production devices, including high speed knives, jointing attachments and other equipment that ensures high production and good work.

The end matching is done on two pairs of "American" single end trimmers and matchers. These machines are automatic. The endless chain feed squaring the material and carrying it past the trimming and matching saws. The machines are set up in pairs, each machine handling one end of the stock. The flooring strips fall on a large table as they leave the matchers. This leaves the material convenient to the operator of the first end matcher. After passing through the latter machine, the piece falls on a belt conveyor which carries it to the second end matcher where the other end is trimmed and matched. The piece now falls on another belt conveyor and is carried up through the floor to a sorting table on the floor above. Here the material is graded for color and grade, after which it is passed to the sorting racks where the different lengths are segregated. The strips are now bundled, stamped with length and grade and placed in the warehouse where they await shipment.

Output Carefully Watched

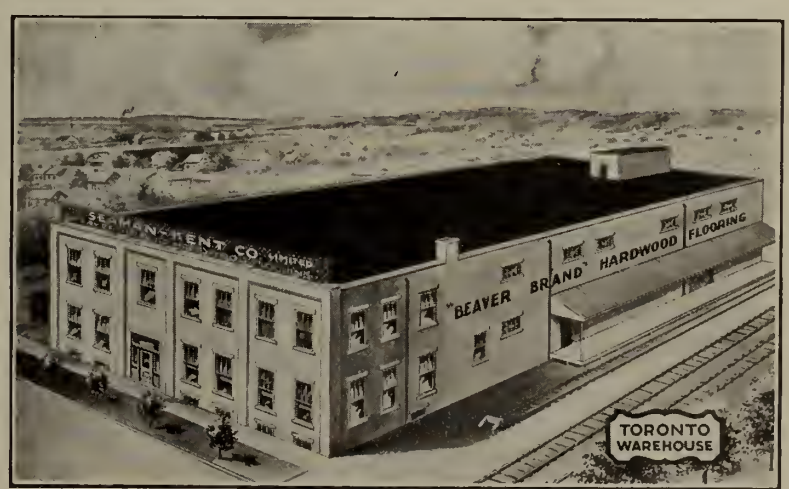
A very close check is kept on the output. Tally meters have been placed on each matcher and readings are taken daily, showing the output of each machine. An accurate record is also kept of the amount of material bundled, showing the different widths thicknesses and grades. This information is tabulated in a special perpetual inventory book, against which all out-going shipments are checked, thus providing a perpetual inventory of the stock on hand.

As far as possible, all waste is turned to profitable account. Any edgings, which are too small for mouldings, are cut to stove length, bundled and sold as kindling.

Special attention is given to fire protection, different preventative measures having been taken. The floors are kept free from sawdust and shavings, two Sheldon shavings exhaust systems being installed for this purpose. The buildings, including the warehouses, are equipped with automatic sprinklers, while a fire pump has been installed to provide a good pressure at the hydrants located at convenient points around the plant. The workmen have been organized into a fire brigade and given sufficient instruction so that in the case of a conflagration, each man will know what to do and what is expected of him.

The Quebec plant is located at St. Agathe, and produces birch almost exclusively. This plant is located in the Laurentian range of mountains, from which comes the finest quality of Canadian birch. The

Head Office and
Warehouse,
Toronto, Ontario



How the Buyers Door & Mfg. Co., Limited, Toronto, display their line to good advantage.

St. Agathe plant is also the largest exclusive birch flooring plant in the Dominion. The output of this factory is sold largely in the eastern provinces, including the city of Montreal. For years, however, a very considerable quantity has been shipped to the New England States, where "Beaver Brand" is becoming well and favorably known. In the city of Montreal the company have their own office and warehouse for the efficient distribution of Beaver Brand birch flooring in the city and outlying districts.

1,735,000 feet on wheels

The total dry kiln capacity of the four plants, at one time, including the Midland factory, is 1,285,000 board feet, in addition to which there is storage track capacity, including the cooling rooms of approximately 1,735,000 feet of lumber always on wheels. Experience has taught this company that it pays well to leave lumber in the cooling rooms long enough to thoroughly cool off before going to the machines.

A large warehouse is maintained in Winnipeg with a capacity of 500,000 board feet of flooring, where a well-assorted stock is always on hand to take care of the western market, and a few weeks ago another warehouse was opened at Edmonton to provide better service for the province of Alberta, including the Peace River country now opening up.

During the last summer a show-room and sales office was opened in Hamilton on one of the main streets. This is maintained in conjunction with the Consumers' Lumber Co. In this sales office a full line of floor finishes, brushes and other accessories are carried and the large volume of sales is good evidence of how the trade appreciates this convenience. The Consumers' Lumber Co. carry a full stock of flooring in warehouse to facilitate quick despatch.

The Seaman, Kent flooring industry maintains a total payroll of approximately three hundred and twenty-five. It is anticipated that this number will be largely increased when building operations again become normal.

Displaying Goods to Advantage

There is an old saying that "well bought is half sold," but a modern version of this might read "well displayed is half sold." An article must be priced right to command a ready sale, but how much easier it is to make the sale when proper display facilities are available. The manufacturer of wood products seems anxious enough to make the price reasonable and instances are not lacking which seem to indicate that he often sells below manufacturing and replacement costs; he seemingly has not, however, come to realize the value of displaying his products to good advantage.

An attractive display of any line not only aids the prospective purchaser in making an intelligent and satisfactory selection, but assists the salesman in many ways for having the article in plain view relieves him of the necessity of doing a lot of descriptive talking. Another point is that when the full line is displayed in an attractive manner, the attention of prospective purchasers is often attracted to items which he might have overlooked or which he even might not have considered.

It is gratifying to note that certain woodworkers are beginning to realize the possibilities which lie in this direction. Some are fitting up attractive salesrooms furnished with comfortable furniture and around which the various products are shown in an attractive manner. Here the customers may be taken to discuss plans, examine woodwork and material and finally to place the order.

The accompanying illustrations show part of the general office of the Buyers Door & Manufacturing Co., Limited, Toronto, and indicate how they have arranged their doors and woodwork for display purposes. One can readily see how this has many advantages over conducting the customer to warehouse or factory. It adds tone and dignity to the organization and is in many ways conducive to increased sales.

The hopper feed on many machines would save a great deal of time and labor.

How Wood Boxes Are Being Developed

Relation of Thickness of Sides to that of Ends—Better Utilization of Box Lumber—Minimum Number of Pieces Compatible with Strength

By J. A. NEWLIN

In an address before the National Association of Box Manufacturers' during the convention held recently at Atlantic City, J. A. Newlin, of the Forest Products Laboratory, Madison, Wis., gave a very interesting outline of the work and aims of the Laboratory at Madison. He referred particulary to the research work being conducted in connection with the development of wood boxes. The following interesting excerpts have been made from this talk:

You doubtless know what the Forest Products Laboratory is. As I tell my fellows, they don't want to forget that we are a bunch of men working for the best interests of the people and that we are merely working with wood. We don't want to try to put wood in the place where wood is not suitable and while we are working to the best interests of the people along my line, I believe it is impossible for us to work against the industry along that special line, that the two interests are one and the same.

In connection with the packages, we are trying to develop a package that, with the least expenditure of money will get the material to the consumer in the best possible condition. There was some mention made this morning as to the amount of loss and damage claim. I don't know, I'd put it at less that ten million due to the poor containers, but that loss I think is a small part of the total economic loss due to poor containers, bad packages, oversized packages and overweight packages, and if you will take all those things into account, the loss, the economic loss will be many, many times the rather small amount that you get back from the railroads.

Work of Laboratory

I would like to review a little of the work of the laboratory for the last ten years very briefly. In fact, this work of boxes, and I of course commenced it about sixteen years ago with the crushing test on the corner and with various machines that brought out to the engineer the necessity for more nails. It didn't bring out to the practical mind the necessity for more nails nor did it emphasize that necessity to the engineer to the extent that it should have emphasized it.

We have gone along in the development of methods of testing till I believe we've got the tests that do show serviceability pretty well although we are not satisfied that we are to the best, at all. We've got a new machine at the laboratory that I expect, when I get back, to give all the motions of a car in transit and see how that continual weaving of the works the nails out under different conditions and just what happens to the box there as well as this tumbling as well as the steady loading. There never has been a test developed that will give you the whole story, there never can be.

Of course you've got to take a look at the boxes in the transit and see how they have held up, but that is the final record without doubt. We have tested about 150 species of wood in the Forest Products Laboratory, I don't remember the exact number, and have made about half a million tests of various kinds. We have had practically all, you might say all of the woods of commercial importance in the laboratory and with most of these woods I have had the experience not only as testing but in their use and from observation on wood in the laboratory, from talking over with all the men that I have met, we made this grouping of woods that you see for the boxes.

We know that under certain conditions grouping is not just what we would have it if it was under other conditions, but it has been as near correct as we know how to make it and I can't see, after some four or five years since we first got it up where we could change it and better it.

Some of The Problems Tackled

We have been working on a nailing schedule. The nailing schedule has been tried out by tests and by observation on boxes in transit and that nailing schedule will undoubtedly make splendid boxes if it is followed.

We have been studying the relation of the thickness of the sides, top and bottom to the ends. With the ordinary Style No. 4 box, we find that we've got the best balanced construction with the sides, top and bottom about two-thirds, not over two-thirds the thickness of the material. Of course with this style of box, the Style No. 2, the thickness of the sides, top and bottom should be about two-thirds the thickness of the cleats.

As you put in wiring, strapping, you can reduce the thickness of the sides, top and bottom. The fact is that if you go beyond about three-quarters, you get such a stiff box that the jars are all transmitted to the nails and the box comes to pieces easier than though you'd use thinner lumber. But as to the thickness of end, you never reach a place where a thicker end would not make a stronger box. You reach a place where a thicker end would not be abvisable because the expense would not permit and the serviceability would not run at all with the expense, so that is the determining feature.

We have been studying the strapping during the past year and will continue to study strapping although not quite so vigorously during the coming year. We have learned enough about strapping so that I think tentative rules can be presented very shortly for your consideration and for your observation of those rules in practice.

Studying Suitability of Lumber

.. We have gotten in the laboratory about two carloads of white pine from the New England states. We realize hat it is essential that we use the very lowest grades of lumber in box construction. The New England white pine is a very good box lumber. We want to know, though, how closely we can use that to economy. In that we are not trying at all to introduce an element of waste, we are trying to introduce an element of conservation.

If you put in larger knots, too large knots, you will have to thicken the sides, top and bottom beyond that which they would otherwise need, and that increased thickness in material would be a bigger waste than

throwing out a little knot once in a while. When you nail up a box and you get knots in the nailing edge, if the board comes off you've got a loss.

How many of those boards are going to come off, and how much trouble can we go to in trying to eliminate that loss and make it pay? Every elimination of a defect must be made to pay. If it doesn't pay, then we don't want to try to eliminate it. We've got lumber in there and are making a very careful study of the influence of those knots on the properties in the thickness of the material that it would have to be used and then when we can get that and go around to your factories and get your end along with it, then we will be ready to specify as to allowable knots in box lumber.

At the present time we are not ready to specify at all, but as I say, all these things have got to be made to pay and not made something that is going to entail a loss to the box industry because if it does it's a loss to the people.

Number of Pieces Permissible

Another thing that we haven't got sufficient information on is the influence of the number of pieces on the strength of the box. We know that the influence of the number of pieces on the strength of the box is as nothing compared with the influence in the number of nails on the strength of the box from our observation of the tests that have been made, but we are not in a position to rightly say whether or not you must limit the number to any specified amount or whether you want to limit it at all. We can't do that with any accuracy at the present time. That is one of the things that we would like very much to study as the time goes on, will study it more or less with the lumber that we have but during this year with our funds that are available we will not be able to make much progress along that line.

Another subject that wants to be studied is tongues and grooves and their influence on the strength of the box. It may be that on these narrow pieces where they are tongued and grooved that we get our nailing on each side of the narrow board and the shrinkage in weight is very small and the tongue would stay in position and it wouldn't matter materially even if a piece were entirely missed at one end with the nails. I don't know whether that is true or not. We want to find out.

One thing that we always try to do there at the Laboratory is to clear our minds of prejudice and if we have had some preconcieved notion and there comes something up that appears to indicate that we are wrong, we go hard after that thing until we find out the truth and then we try to put ourselves in line with that new fact that we have discovered and I find that those, when we find some new fact that way that upsets some previous thought or conception, that we are nearly always or we are always better off for having found that; it does not, except for the immediate future, upset things. The immediate influence at times is to upset conditions and the application of the new fact would have to go slow, but we always have to line ourselves up with the facts.

Proposition of Box

Another thing that we are studying to a certain extent but only incidentally at the present time is the thickness of lumber in relation to the weight that we are to ship, the size of the box, the commodity which is to be carried and the service, whether foreign or domestic and things of that kind. Now that is a big study and it will necessarily take some years before we get the final answer, but when we get the answer to these problems from which I have indicated we have partial answers and those that we have only just touched, I feel then that we will be able to get a specification that will be a real specification that will tell you how to make a box that can best compete with all other boxes on the market, and that is the thing that the people of the United States, the box manufacturers, are all interested in. "Can we make the box that will give the maximum of service at the minimum of cost?"

Made in Galt Exhibition

The manufacturers of Galt, Ont., of which there are a considerable number, recently held a successful Made-in-Galt Exhibition. The displays covered a wide range of articles and were so numerous that they filled two rinks. It came as a surprise to see the variety and the quality of the lines produced in Galt.

Of particular interest to the readers of the "Canadian Woodworker" would be those dealing with wood products or wood-manufacturing equipment. Such displays included the Victoria Wheel Co., Limited, showing shafts, rims, spokes, whippletrees and bent handles; the Galt Wood Products Co., displaying sleighs, ironing-boards and clothes-horses; McDonald Bros. with their line of kitchen tables, wood turnings, tea waggons, cedar chests and lamps; G. W. Gardiner & Son showing doors, sash, frames, columns and woodwork of various kinds.

The following manufacturers of machinery and equipment had attractive displays:—Canada Machinery Corporation, who showed their ball bearing band saw and ball bearing shaper being driven by the motor of a small portable electric house fan: Cowan & Co. of Galt, Limited, were displaying such machines as pony planer, hollow chisel mortiser, jig saw, chain mortiser and power feed rip saw: Shurly-Dietrich Co. made a very attractive display showing their complete line of saws and tools against a background of black velvet; this exhibit covered the walls at one end of one of the rinks: The Shimer Cutter Head Co. and the Galt Knife Co. made a joint display of profile, matcher, shiplap, sash and door, and special heads, also plain and milled knives, mortise chisel and special knives. The Sheldon Company showed their well-known Keith fan and had a small model plant fitted up with a shavings exhaust system. The Sturtevant Co. of Canada, Limited, made a display of their shavings exhaust and ventilating fans and also a portable electric vaccum cleaner which they are manufacturing.

Turning Wood Waste into Profit

The Andrew Kaul & Co., Incorporated, of Merrill, Wisconsin, are deriving a nice profit from the waste from their large woodenware plant. This waste was formerly sold at $6.00 a cord. At the present time it has been turned into a wide variety of articles, such as rolling pins, pail and knife handles, bowling pins, spools, bobbins and wooden plugs for paper rolls. They find a steady demand for all these products. Another line they are handling successfully is waggon wheel hubs, spokes, automobile spokes and felloes. Sufficient orders are in hand to keep the spoke and wheel department busy for the next twelve months.

There is a good suggestion here and it can be profitably followed and adapted to other plants and lines.

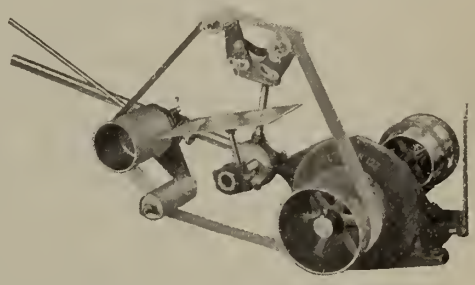
Machinery & Equipment

Plate Gluing Device

There are several methods of applying glue to the edge of stock when making glue joints. It may be applied with the brush, roll or plate spreader. The accompanying illustration shows a type of plate spreader which is being placed on the market by Jackson, Cochrane & Co. of Kitchener, Ont. The method of operation can be grasped readily from this cut. The operator picks up whatever number of pieces he can handle conveniently and then presses the foot lever which lifts the perforated plate up out of the glue, so that by simply resting the edges of the stock on the plate and then moving the material backward and forward about one inch, the edge will be completely and evenly covered with glue. When the foot lever is released, the plate drops back into the glue and is ready for the next batch. The plate has a large number of perforations of proper size and so placed as to allow surplus glue to drip back into the tank and leave only sufficient glue between the perforations to give the stock an even application and to prevent waste. The spreader is steam-jacketed, so that the glue is always warm and ready for instant use. The inner tank, which holds the glue, is lined with heavy copper. The tank is fitted with a water faucet and the glue valve for drawing off surplus glue. An overflow pipe and a safety valve prevent back pressure in case the overflow pipe becomes clogged. This spreader is made in two sizes, 5 ft., 11 ins. and 7ft., 11 ins., inside measurement. The tank is 5 ins. wide and 5 ins. deep, while the perforated plate is 4 ins. wide and 1 in. shorter than the tank. This method of gluing joints is claimed to offer a considerable saving of time and glue over any other method and should greatly increase the capacity of revolving glue clamps wherever the latter are used.

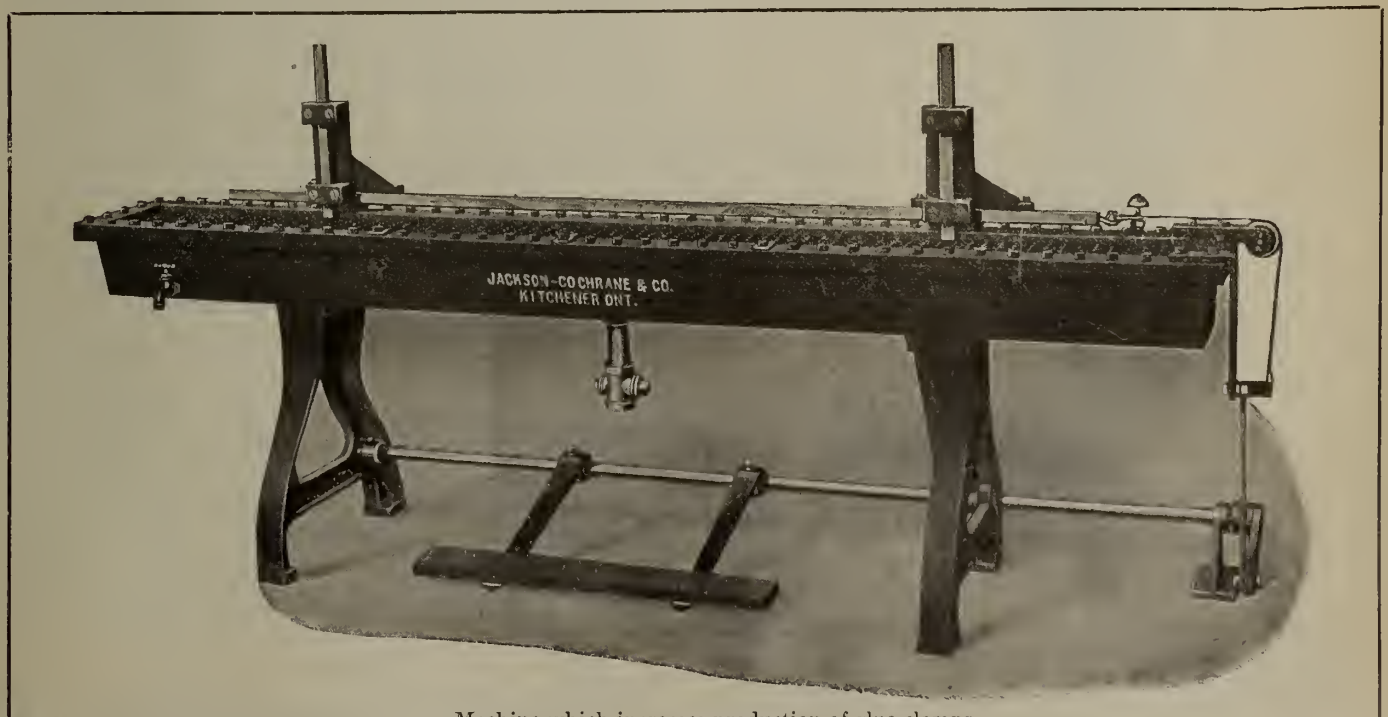
Flexible Belt Sander

A flexible type of belt sander, designed primarily for the rapid sanding of all kinds of small and irregular-shaped pieces, such as brush backs, toilet seats, frames, period legs and various other shapes common

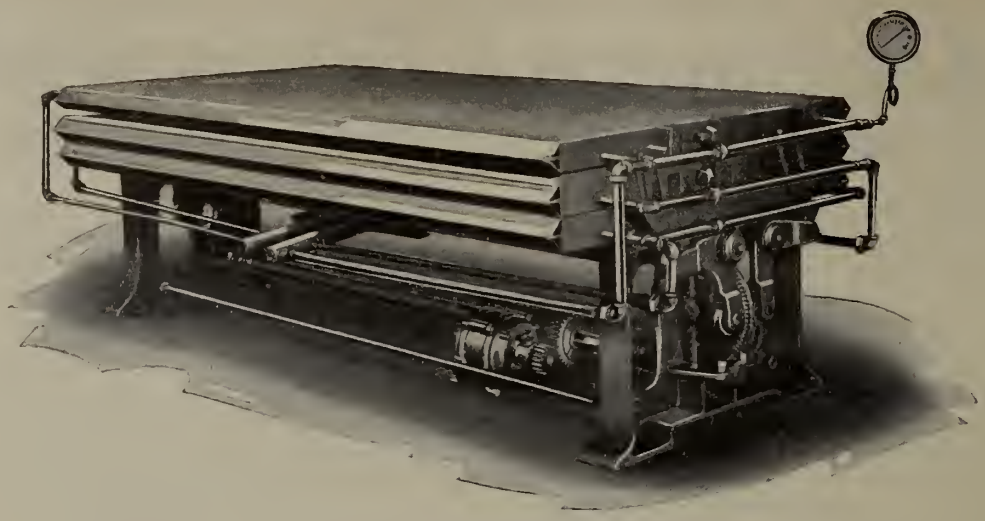


Showing how Oliver flexible belt sander can be adapted to special operations.

to furniture factories, is shown in the accompanying illustration. This is known as the "Oliver No. 127 Variety Belt Sander," and is manufactured by the Oliver Machinery Co. of Grand Rapids, Mich. The principle of this machine involves a main drive pulley mounted on a counter-shaft so that the entire frame swings about the centre line of the counter-shaft. On the supporting arm are carried two clamp racks for

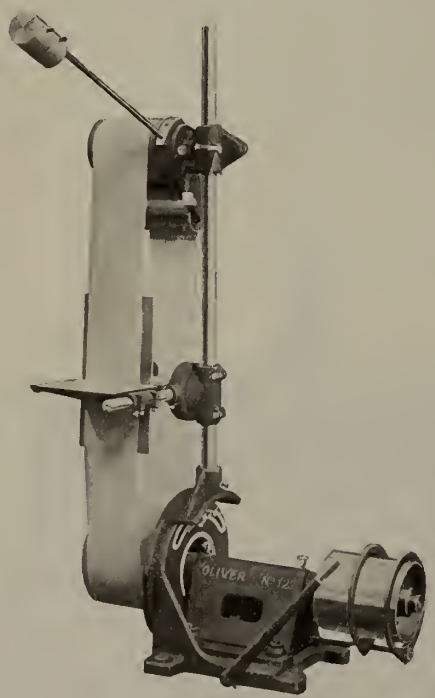


Machine which increases production of glue clamps.



Three plate veneer re-drier for small plants.

supporting the main idler pulley and the tension idler respectively. Another supporting arm carries the table and backing plate, or for special work special air flexible pads may be carried in place of the plate. The machine will accommodate belts up to 10 inches wide and as long as 14 feet. The edging table tilts up or down to 30 degrees. The backing plate is 10 inches wide and can be adjusted in or out to suit tension on the belt. It has holes for attaching flexible pads. The main idler runs in ball bearings and is adjustable up or down the whole length of the idler arm, thus



Flexible belt sander used as a vertical machine.

enabling it to take care of belts of various lengths. This pulley is faced with leather. The fork idler may be mounted on the machine in place of the regular table. It is used for doing oval sanding, such as oval frames and other irregular shapes. This idler is of rigid construction and carries two aluminum idlers running in ball bearings. The machine is 80 inches high and requires a floor space of about 4 x8 feet. It should be driven at 900 r.p.m. and requires 2 h.p. It may be had either for belt or for direct drive by electric motor.

Three Plate Veneer Redrier

The October "Canadian Woodworker and Furniture Manufacturer" contains a description of the Merrit Balances Plate Veneer Redrier for the redrying of veneer and crossbanding stock. The Merritt Engineering & Sales Co., who manufacture the above machine, have placed on the market a new piece of drying equipment in the shape of a three-plate veneer redrier. This machine has two openings only and is designed for the smaller plants who have not sufficient work to warrant the expense of a large capacity machine. This new redrier is electrically-driven and is bought for connection with the factory steam line. A vertical movement of the metal plate gives pressure first in one opening and then in the other and provides the well-known breathing movement peculiar to Merrit hot-plate redriers. This machine, which is shown in the accompanying illustration, flattens and dries at the same time. The heat is applied uniformly to both sides of the stock and to the edges and ends so that no one part dries faster than another. This, coupled with the releasing of the pressure during the breathing movement, eliminates the liability of checks and splits appearing. The flattening of the stock is a matter of no small importance. This is especially true of face material. A sheet that is wrinkled or corrugated is hard to joint and does not get an even distribution of glue when going through the spreader, requiring a heavy applicaiion of glue to prevent loose veneers or blisters. The drying of veneers and crossbanding is receiving more attention than formerly because the necessity of having such stock thoroughly dry at the time is more widely realized. For this reason the demand for equipment of this type is increasing.

If a saw is not jointed frequently two-thirds of the teeth are often out of commission by being too short to touch the wood.

Upholstering and Trimming

Modern Upholstering

Describing Application of Down Cushions to Chairs of Various Types

There are many types of down-cushioned chairs for which the upholstery instructions would be practically the same as for the chair, which, up till now, has been described in this series. This would include such chairs as Figs. 53, 54, 55, 56, and 57, for while they differ somewhat in arm construction, the main body of the upholstering is executed after the manner already described in connection with Fig. 41.

On Figs. 53, 54 and 55 there is a scroll, which is a continuation of the curve of the arm. The covering of this is planned to be continuous with the arm covering, and a seam, which is concealed by the cushion, joins the two sections, allowing for a sufficient amount of padding on the block, so as to make a smooth surface to the body of the column. The scroll face of the arms being put on subsequently conceals the edges, while the lining of the outside arm and the covering of the front nosing and rail complete the operation.

Fig. 56 is not sufficiently different from Fig. 41 to require any extra explanation, the principle of upholstering being exactly the same.

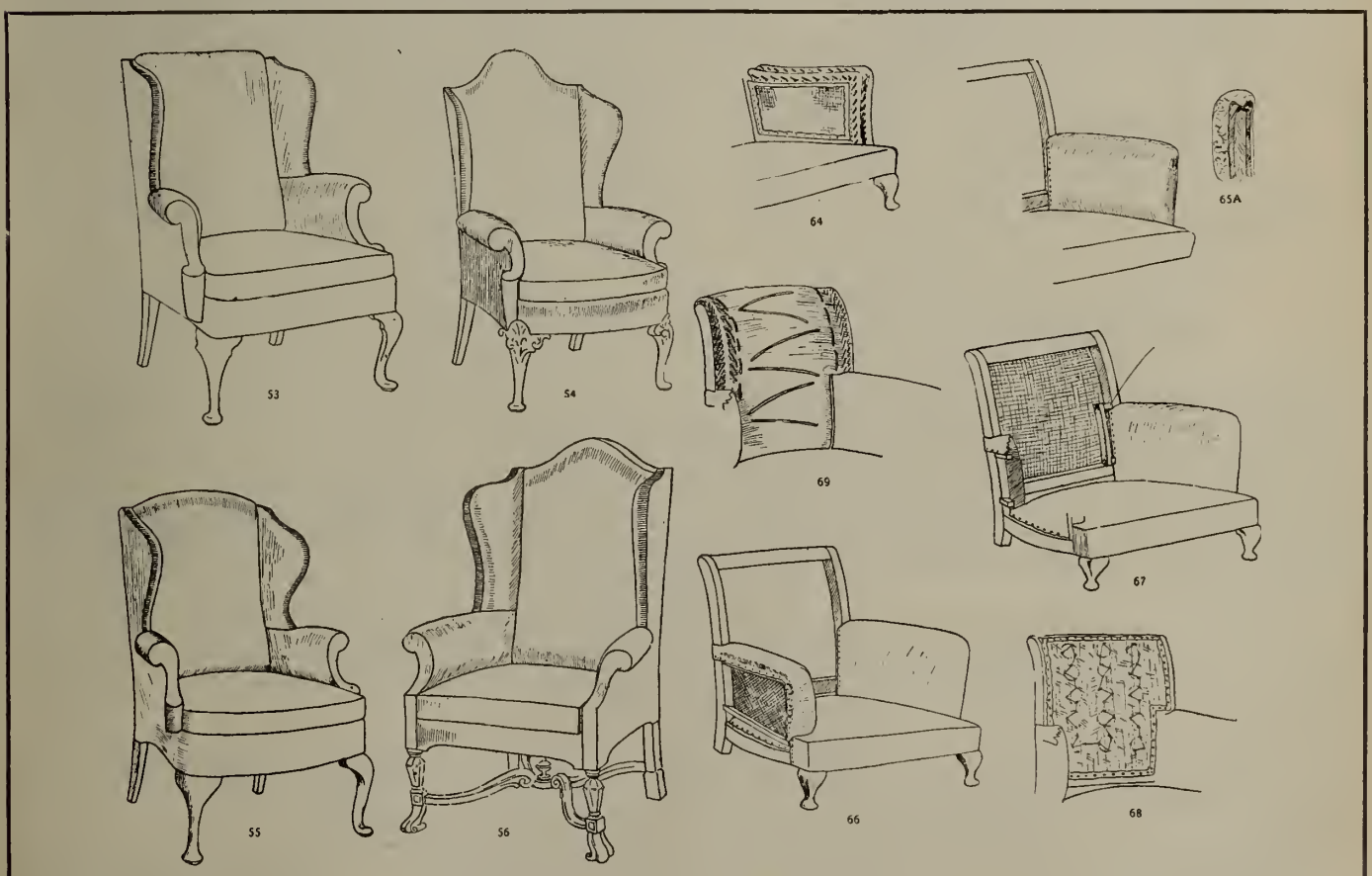
Another Type of Chair

We will take up another type of furniture for the further elucidation of the subject of down-cushioning.

A soft filling of hair is now employed to fill the crevice formed by the stitching of the two rolls, giving the entire arm a symmetrical shape, as indicated in Figs. 65 and cross section 65A. The other arm is treated in the same way and the chair will then present the appearance of Fig. 66.

It will now be necessary to arrange for a block to be attached to each outside back post, as indicated at A, Fig. 67, which will permit the covering of the back of the arm to be drawn through and tacked on the back, making a closed join. To better show the treatment of the back, one arm of the chair is indicated as if cut away.

The outside back is canvassed, as shown in Fig. 67, and five rows of pillow springs, three to a row, are sewn to the canvas and tied down in the regular way, but kept as high as possible in order that they may be extremely soft. A layer of canvas is then placed over the springs, drawn and tacked loosely



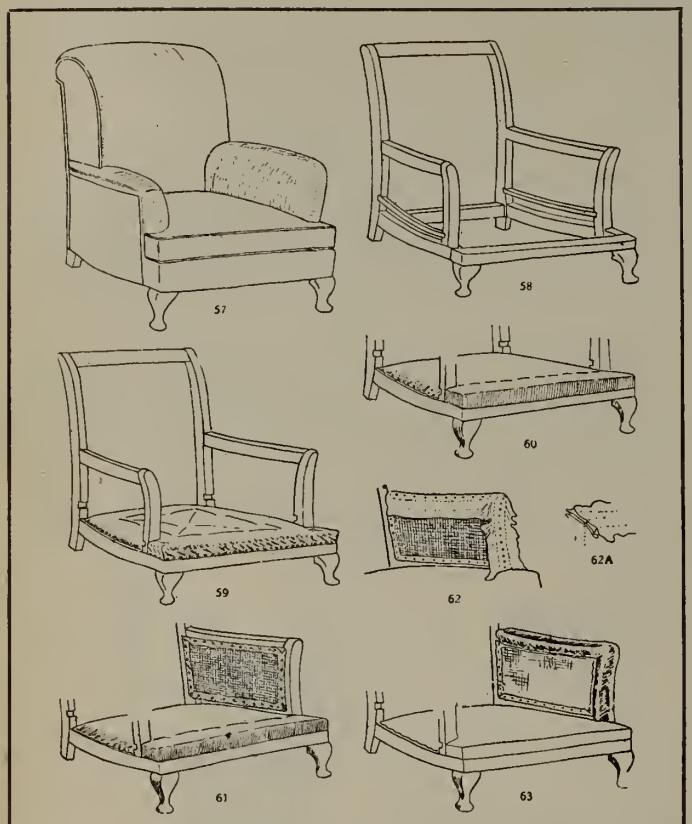
Chairs showing variation in arm construction.

and sewed to the tops of the springs, presenting the condition illustrated in Fig. 68.

The chair illustrated in Fig. 57 brings our study of down-cushioned upholstering to another stage and to a different type of chair from the one described in preceding instalments.

The frame of this chair, shown in Fig. 58, is exceedingly simple and gives little indication of the appearance it is to assume in the upholstering. For this reason we give, at the outset, a sketch of the finished chair in order that the workman may have in mind the object to be attained even in the preliminary processes which are first described.

It will be noticed first of all that the chair frame, Fig. 58, is provided with removable arm rails (see A in diagram), which greatly facilitate the upholster-



Chair with removable arm rails.

ing of the seat. All of the preliminary processes with regard to webbing, placing and tieing of springs are practically the same in connection with this chair as were described in connection with the first chair shown in this series. Reference should therefore be made for these preliminary processes to Figs. 1 to 6 of the first instalment which was included in the July issue of the "Canadian Woodworker and Furniture Manufacturer."

Following the canvassing of the springs, the subsequent processes are different and call for the use of a light, soft double-stuffing, indicated in Fig. 59. The front edge of the double-stuffing is stitched up uniformly with a slight projection beyond the frame, but is kept very soft and pliant. A very light coating of hair and wadding is placed on top of the double-stuffing and then a covering of muslin, giving the appearance shown in Fig. 60.

The arms are next in order for attention. The loose rails are nailed into place, as shown in Fig. 61. On the tops and fronts of the arms a soft, double roll is produced by tacking a piece of canvas, as shown in Figs. 62 and 62A. This is stuffed softly, as indicated in Fig. 63, and stitched after the manner of Fig. 64, taking care always to keep the edges uniform and avoiding hardness.

Floors

The Eskimo has floors of ice, and probably he thinks them nice, and strictly up-to-date; but if there ever came a thaw they'd be the worst you ever saw, and that's as sure as fate.

The Arab has his floor of sand; I have no doubt he thinks it grand, a floor beyond compare; but sand is full of bugs and ants, and they climb up a fellow's pants, when he sits in a chair.

The Mexican has floors of dirt, and floors of that sort will not hurt, so long as weather's dry; but when there comes a season wet, such floors are not the one best bet, which no one can deny.

In olden times men built their homes with battlements and towers and stones, and ornaments of gold; but all the floors were made of stone, and they made people sigh and groan, they were so hard and cold.

And then with rushes they were strewn, to make them warmer to the shoon, and also to the feet; and those stale rushes would decay; their scent would drive the folks away, in agonized retreat.

It took uncounted years of toil and planning by the midnight oil to dope out modern floors; the floors on which we dance and walk, and sing and cuss and wildly talk of hoarders and such bores.

The floors on which we spend our lives, and train our kids, and beat our wives, are surely handsome things; be they of color light or dark, we proudly view them and remark, "They're good enough for Kings."

Your mansion might have jasper walls, the finest paintings in its halls that artists can produce, and onyx stairs and marble doors, but if it had no modern floors, 'twould be a poor excuse.

Good hardwood floors make life a poem; they beautify your happy home as nothing else can do: your lumber dealer has the best; the years have given it the test that means so much to you.

Business Continues to Show Improvement

Conditions are on the mend. Not only is there a feeling of better times in the air but business is on the increase. The fact that certain commodities have increased in price during recent weeks is a most encouraging sign, especially after such a period of liquidation as has been experienced. It means that greater stability may be expected. One large mail order concern records an increase in value of orders received as compared with the same period last year. This in spite of the fact that prices have been reduced on an average of 30 per cent. Stocks in the hands of retailers are reported to be very low, with the result that they are buying more freely. The demand for furniture has shown an improvement. In the mill work industry the call for woodwork is strong. All down the line trade shows signs of gaining strength Part of this is seasonal, but some of it is due to the fact that the worst is over and that conditions are definitely on the up-grade. No extensive improvement need be anticipated before spring but in the meantime we are building a solid foundation for better times.

Successful Furniture Exhibitions in United States Centres

The furniture exhibitions held recently at Jamestown, High Point and New York, were very successful. A gratifying number of buyers were in attendance and the buying was all that was expected. Many of the manufacturers exhibiting report that they booked enough business to keep their plants operating to capacity, well on into the new year.

The buying might be termed spotty, in fact it was a repetition of the January and midsummer markets in that most of the business went to those manufacturers who brought out new and attractive lines and who had figured their prices down to the lowest notch. Those who refused to accept the lesson of the earlier markets and who attempted to put over their old lines, depending entirely upon small reductions to make sales, were disillusioned and were forced to see their competitors take the bulk of the business.

If, as Roger Babson has stated, those sections and industries which were hit first, will be the first to recover, the success of the eastern market augurs well for the furniture industry. The east was the first to suffer when the depression hit the country and as indicated by these markets, has shown a partial, if not complete, recovery. Taking this point of view, the January markets should prove to be an unqualified success.

Cooperage Stock Imports During 1919

The U. S. Department of Commerce Bureau of Cencus recently issued some statistics covering the production of tight and slack co-operative stock during the year 1919. Touching on exports, this report states that during the year in question the value of the staves and headings exported was greater than for any previous year. In itemizing this statement, it was found that the exports of Canada for 1919 were as follows:— 26,841,432 staves, having a value of $710,570., or an average value of $26.47 per M. staves. As far as quantity is concerned, Canada took more cooperage stock than any other countries to which this material had been exported, but in value of exports goes to the United Kingdom and to France where considerably in excess of those to Canada Canada has many large establishments devoted exclusively to the production of cooperage stock. In view of this, it is hard to see why so much cooperage material of American manufacture should be used in this country.

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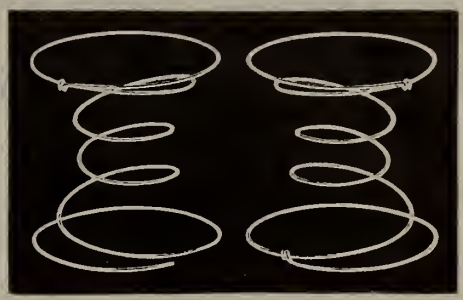

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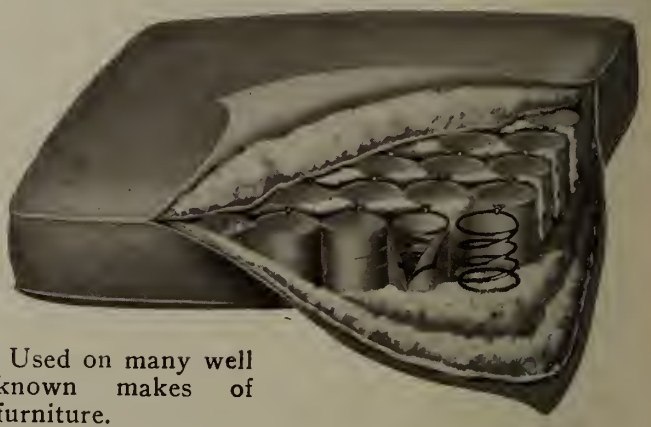

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How to Finish Oak

Suggestions for Securing Different Shades and Finishes—Giving old Appearances to Jacobean Finish—Details of Ebony Finish

In addition to ammonia, which is used for both fuming and staining oak, there are several stains that will produce beautiful effects on this wood. The grain of oak rises considerably when stained with a water stain, consequently it is advisable when using water stains to counteract this by first covering the wood with water and when dry easing the grain which has risen by rubbing the whole surface with fine glass paper. Coarse glass-paper and vigorous rubbing should be avoided, or the benefit of this precaution will be lessened. Jacobean oak furniture in what is termed the Jacobean style has a considerable vogue, and finishers will find the following a successful and inexpensive method of imitating the appearance of old work.

Having papered the watered oak, apply a strong solution of common soda and water. When dry, rub all over with vandyke brown and turpentine; this can be rubbed in the exposed portions of the work to give it the appearance of age. When dry give the whole a liberal coating of stiff polish, which can be rubbed flat with fine glass-paper after a few hours. A further coating of polish will be necessary to make the finish more durable, and any glaring unevenness of color can be remedied by the use of the black colour brush —a little gas or lamp black diluted with spirit may be used for this. Cover this with a further stiff coat of polish to fix the colour, and lay aside; when dry rub a little beeswax over the whole surface (two thirds beeswax to one third turpentine). Rub this briskly with a piece of rag and finish off with a good brushing with a medium stiff brush of the shoe-brush type. A word of warning may possibly be helpful at this stage. As a rule the pores of oak are not filled, consequently when "stiffing up" with polish don't attempt to choke the grain; and when waxing be sparing with the beeswax and generous with the rubbing.

For Dark Effects

The followng selection of stains will be found useful where a dark color is desired. Perhaps the simplest is strong coffee. Vandyke and water will produce a greenish brown effect. Vandyke may be obtained ground in water and then diluted with additional water till the desired strength is obtained.

Equal parts of sulphuric acid and water to which some iron filings are added will produce a dark stain, if by chance too much sulphuric acid be used, a little ammonia (.880) applied to the over-dark portion will quickly neutralize the ill-effects of the acid.

Boil 1 lb. logwood chips in a quart of water, add 1 oz. of tartaric acid and apply hot.

Permanganate of potash is another good brown stain; the purple color that shows at first quickly disappears.

Another homely dark stain suitable for either walnut or oak is the ordinary green husk of the walnut boiled in water; this can be applied either hot or cold.

A very nice effect may be obtained by applying a paste of slaked lime. This will not have so much effect on the "flower" as on the body of the wood, producing a pleasing contrast. When dry, brush off and polish in the usual manner.

Grey and Black Tones

Mix green copperas with water to the desired shade Like ammonia, the effect of this stain is dependent upon the tanic acid contents.

Iron acetate, which can be made by steeping iron filings in dilute sulphuric acid and water, will produce a very good grey.

Nigrosine is by far the blackest colouring medium extant, and like most anilines is made soluble in spirit as well as in water, so it is advisable when purchasing to state clearly what is required. Each produces a very black effect, the difference being that a spirit stain naturally dries off more quickly than water, whilst a water stain remaining fluid for a longer period is capable of more even application; this particular difference is applicable to all stains and is of greater importance where the shades are more delicate than in the instance given above.

Bog Oak Stain

An ounce of permanganate of potash in a pint of water, melt an ounce of verdigris in half a pint of vinegar, mix the whole together and apply.

A deep brown stain can be made by a solution of nigrosine and water to which is added some Bismarck brown. Whenever Bismarck brown is mentioned as a stain or as a coloring medium it will invariably be found that "a little " is mentioned and this should be taken very literally. Bismarck is a very violent color and must be treated accordingly; if a speck or two be placed on the hand and a little water or methylated spirit added its strength will soon be apparent.

Although there is very little call for green oak at the present time, it will be useful to set down the following for use should the occasion for it arise. Four ounces of verdigris in a quart of vinegar, add half an ounce of napthol green, half an ounce of indigo, a little brown stain and dilute with water to the required strength and shade.

Black Stain

This is often miscalled ebony stain and recommended for ebonising woods; why this popular misunderstanding sould be so general is inexplicable, for, as most woodworkers know, ebony may be any shade from pink to deep rifle green.

The woods used for ebonising are close in texture with scarcely any pores, as pear-tree or beech; if a hard wood is used, nigrosine will be found to be the most penetrating, a solution of, say, four ounces of

nigrosine in three quarts of hot water will give a good black stain.

For strengthening the other ingredients of black stains an iron solution is frequently used, such as an iron acetone or iron filings in acetic acid; the same result can be produced by placing a handful of rusty nails in half a pint of vinegar. Nutgalls and logwood in combination with the above iron solution are the main ingredients of almost every ebonising stain.

Boil in an iron vessel, for preference an old saucepan, two quarts of vinegar, 1 lb. of extract of logwood, quarter of a pound of green copperas, 2 ounces of china or indigo blue and one ounce of nutgalls, then add half a pint of "iron solution."

Boil two ounces of extract of logwood, 1½ oz. of copperas in 2 pints of water, apply hot, and then give several applications of iron solution.

Rub the wood with a strong solution of sulphuric acid and hold it in front of the fire, which will immediately turn it black, this is a suitable method for blacking small articles a dead dull black.

Two pounds of logwood, half a pound of copperas, four ounces of drop black, one pound of logwood extract boiled for a considerable time in two quarts of water, when cool strain off through some muslin and add an ounce of powdered nutgalls. Boil together powdered nutgalls, logwood chips and alum until the water turns black, strain off and apply warm; several applications may be needed for a deep color, then apply a coating of iron solution.

Grey Finish on Elm

While it is unquestionable that feminine fashions are suggested and stimulated by French creations, it is equally true that the varying vogues in furniture are initiated and encouraged by new and attractive woods which from time to time are placed upon the market, says a writer in the Timber Trades Journal, London. Whereas at one time choice mahogany was the furniture wood par excellence, the tremendous difference in prices and change of ideas have led to the extensive use of walnut, birch, and other timbers, each having its own characteristic merits. Now another wood is rapidly coming into favor in the form of British greywood, which is already widely in use among the large furniture manufacturers, and we have seen specifications for considerable orders to be executed in this wood, which, by the way, was displayed for the first time to great advantage at the recent Building Trades exhibition at Olympia. In fairness we should say that there is now more than one greywood upon the market, but the particular species we refer to at the moment is what is known as British greywood (patented), and as there appears to be some uncertainty as to the merits and qualities of this wood, we recently paid a visit to the works where it is being turned out on a large scale.

As those who visited the exhibition at Olympia are aware, the various manufactured articles made from Brtish greywood were exhibited to demonstrate the practical uses of this wood, which is prepared from selected English elm—a wood hitherto looked upon by most people as only fit for the commonest work, because of ts tendency to twist and shrink. By this treatment this tendency has been entirely eliminated, and there is now no reason why the wood may not be safely used in the manufacture of every form of joinery, fittings, furniture, and parquetry flooring. All that is required is the same intelligent handling necessary in the use of any other type of hardwood, and it can be confidently recommended to architects and designers as a valuable decorative wood, its remarkble neutral tint rendering it unique for practically every color scheme. The value of the wood is accentuated by the fact of its being grown in this country and entirely prepared by British labor.

Britsh greywood is an English elm treated by a special process, by which the pigmentary cells of the wood are changed from the natural light brown color to a beautiful grey tint. The wood is not dyed or stained but is naturally colored by the combined action of the inherent acids of the tree and other chemical agents scientifically applied. The tree is quartered and cut into the required thicknesses, and then treated, and is afterwards carefully dried by a process evolved during the war for drying aeronautical timber. The process does not in any way injure the wood; on the contrary, it has the advantage of preserving it and hardening its fibres, and further kills all tendency to worm. The wood is eminently suitable for parquet flooring, furniture paneling, doors, windows, in fact, anything and everything that requires a decorative feature, for, being a neutral tint, it will not clash with other colors, and makes a quiet and dignified background. To use the wood to the best advantage, in all big framings, it is advisable to build it up on a softwood core or backing. When properly clamped up it makes an exceedingly strong joint, adhering neatly to its backing. When glueing up, it is better to wet the faces of the grey wood with steam or hot water. This makes the wood more pliable and it goes down on to its bed more satisfactorily, and when thoroughly set, can be brought to a very fine finish.

Greywood makes splendid veneers and glues down remarkably well. The greywood must not be French polished; it may be left absolutely plain from the tool, or polished with white paraffin wax dissolved in turpentine with a small piece of resin to harden the polish. For finer work, white or colorless polish must be used. It maintains its color, and neither fades nor turns yellow and in cost is comparable to ordinary foreign hardwoods.

Toy Exports on Decline

A few German toys are arriving in Canada for the Christmas trade. What is said to be the first cargo of German merchandise of any considerable size arrived at Montreal recently. Although German toy manufacturers are attempting to secure the world markets few firms are trying to sell in Canada. This is due to the Customs regulations which went into force early last year, by which the Customs duty on goods imported from Germany is based at 50% of the pre-war rate of the market. This works to the disadvantage of the German manufacturer as a purchase of goods costing $75.00 in Canadian money, the Customs duty might amount to something like $40.00.

Japanese toys are not as plentiful as in recent years. Owing to the high cost of living which prevails in Japan, the Japanese toy manufacturers have not been able to manufacture them as cheaply as formerly, and are thus prohibited from flooding the outside markets with their cheap toys.

This gives the Canadian toy manufacturer a better chance than ever before to secure and hold our own markets against outside competition.

Italian Renaissance Finish

Under the title "The Origin of Polychrome" the October "Canadian Woodworker and Furniture Manufacturer" ran an item which contained a reference to Italian Renaissance as well as to Polychrome. These two finishes do not resemble each other in the slightest being entirely different. Polychrome as the word implies means the reproduction of many colors. In a true polychrome these colors are subdued and dimmed until they have that dusty look which characterizes ancient carvings as they appear to us after having been exposed to the elements for many centuries.

The Italian Renaissance finish on walnut or oak is not a polychrome in any sense of the word. An attractive Italian Renaissance finish may be secured as follows:

Sand wood smooth. Stain with following formula:
Nigrosine Green Black ..... 1 Oz.
Warm Water ..... 1 Gal.

Where sap streaks exist in wood, add ¼ oz. Crystal Sulphate of Iron to above formula. Dry thoroughly after applying stain, sand lightly.

Apply coat of 40 to 60 per cent mixture of wood lacquer dry; about four hours (sand smooth).

Rub in a coat of Wax to which dry Zinc White has been added (3 parts of Wax to 1 part Zinc.) Relieve excess wax with a soft piece of cloth, to desired tone.

Standard Definitions for Case Goods

The National Alliance of Case Goods Associations recently adopted definitions to apply to the buying and selling of case goods. This is in line with a similar move on the part of the National Council of Furniture Associations

SOLID

Bed room or dining room Furniture designated as "solid" shall have all exteriors, except case back, case bottom and mirror back, of solid wood of the kind designated.

The interior of the case may be constructed of such woods as the manufacturer may consider most suitable for the purpose.

GENUINE

Bed room or dining room furniture designated as "genuine" shall have all exterior case back, case bottom and mirror back, of the kind of wood designated. The tops, fronts and ends may be plywood.

The interior of the case may be constructed of such woods as the manufacturer may consider most suitable for the purpose.

COMBINATION

Bed room or dining room furniture designated as "combination" shall have the tops, drawers, fronts or doors and ends of plywood or solid wood of the kind designated. The remainder of the case to be constructed of such woods the manufacturer may consider most suitable for the purpose.

SUBSTITUTE

When the word "finish" is used in connection with the name of a wood, such as Walnut Finish, Mahogany Finish, Oak Finish, etc., in describing bed room or dining room furniture, it may be applied to furniture made of any woods considered by the manufacturer as most suitable for the purpose.

All Imported Joinery Must be Union Made

Further steps are being taken by British labor unions to force their will on Canadian manufacturers. They call it, however, "foiling the dumper," says a recent cable despatch. An agreement has been arrived at between the unions concerned with the building trades to ensure that all imported joinery has been made in union shops. Such goods must bear the union label or British woodworkers will refuse to handle them.

"The dumping of goods manufactured under conditions which do not appeal to us as union men has been going on by the United States and British Columbia, especially with regard to house doors," said the secretary of the woodworkers' society, London. "The employers and ourselves have taken this step entirely on our own, and it is the first action of the kind to be taken by an industry in any country."

This is not the first time, however, that international action has been considered by British labor with regard to Canada. After the Winnipeg labor troubles two Canadian unionists arrived in London with the avowed intention of securing the release of the convicted strikers by influencing the British transport workers to refuse to handle Canadian imports. Their mission did not succeed.

Are Millwork Prices Too High?

Why is it that the home builder always expects cheap woodwork? He is willing to pay a fair price for almost every other item entering into a house, but when it comes to the woodwork, especially if a high-class job is required, he usually balks at the price.

Commenting on this phase of the millwork business, a prominent woodworker stated that recently he was approached by a prospect who had considerable means, and asked to quote on some built-in fixtures for his new home. This home-builder had his quotations on lumber, heating and all other work. When buying the hardware, two different styles and finishes were shown, the difference in price being in the neighborhood of $225.00, and the high price line was purchased without a murmur. When the cost of the millwork was submitted to him, he went straight up in the air. All the other items which went into his house had met with his approval,—high-priced hardware, costly face brick, lighting fixtures, plumbing fixtures, etc., yet when the millman quoted a fair price, in fact a competitive price, the customer thought he was being robbed.

Does this not suggest that the millwork industry either individually or collectively, should take steps to educate the public to the fact that millwork prices are too low, if anything, and to the value and satisfaction to be derived from having high-class woodwork in the home.

It is an advantage to have the lower wheel of the band saw heavier than the top one, as it checks the tendency of the top from overrunning the lower one when the speed slackens.

The man who works a modern planer should remember as he draws out the bottom cutter block that his father had to crawl under the machine to set or to sharpen the cutters.

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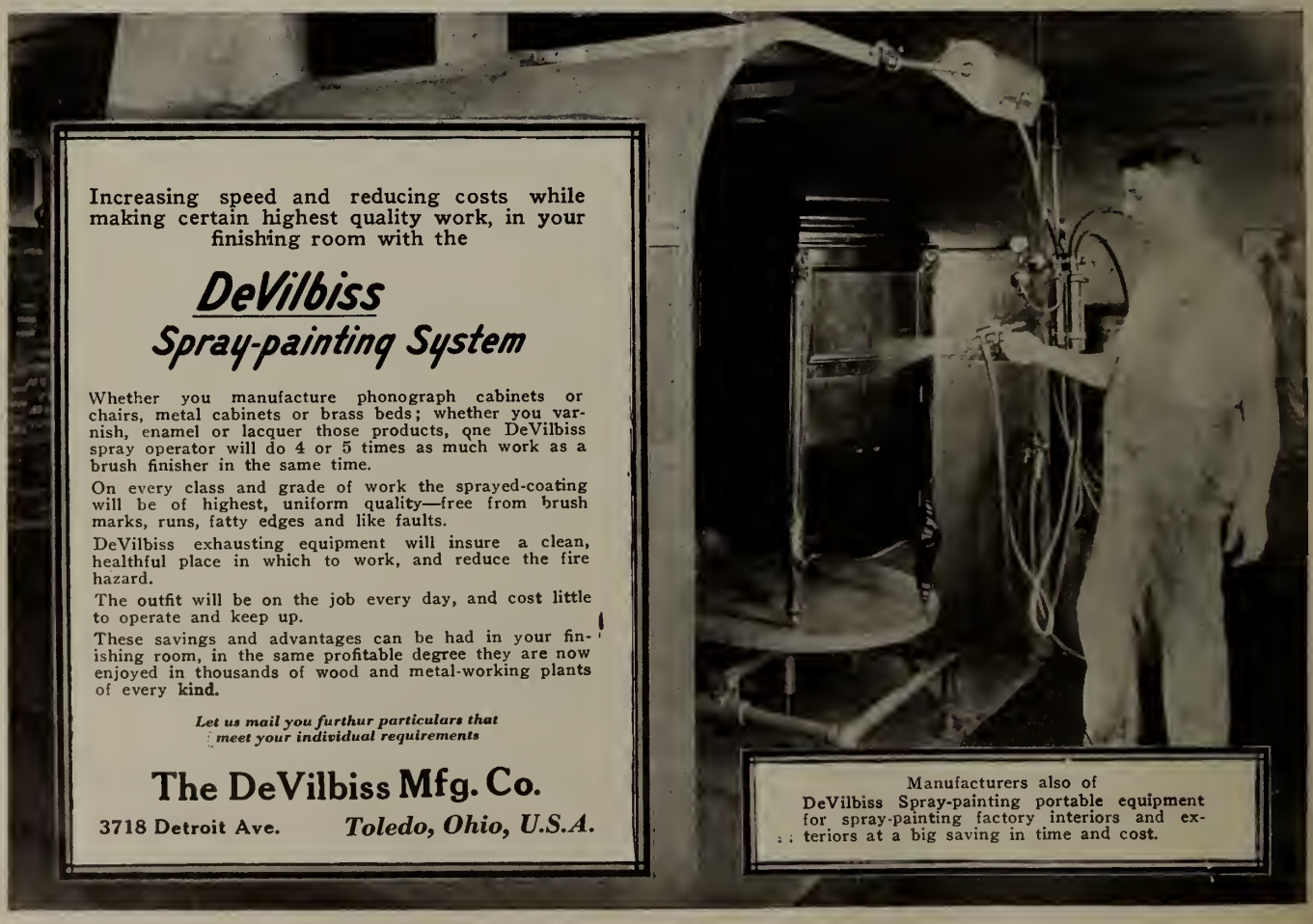

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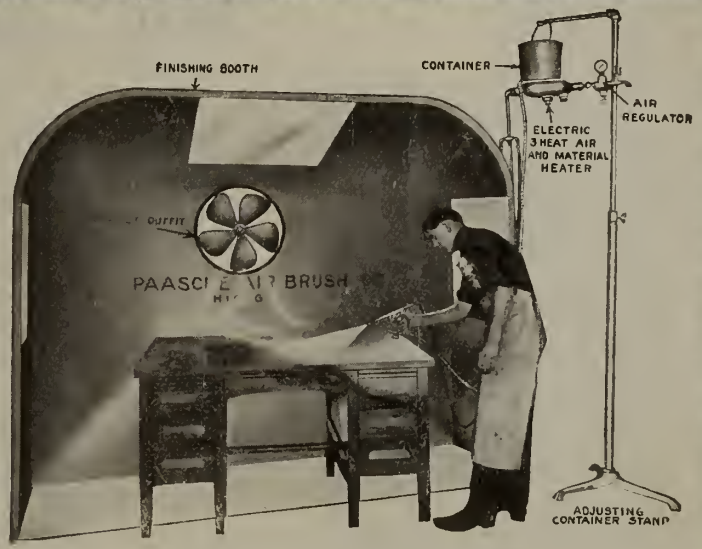

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Veneers and Panels

Getting Results In Veneer Room

Straightening and Drying Small Lots—Overcoming Split Ends—How Good Joints are Made

By H. Graham

In a plant where the quantity of veneer to be dried is not great enough to warrant installing a redrier a common practise is to dry the veneer between hot cauls, first wetting it thoroughly so that it will be perfectly flat and easy to work with when it is removed. The best cauls the writer ever saw for this work were made of basswood. This wood, being of a very absorbent nature, takes up the moisture from the veneer, and then when put in the caul heater to be reheated the moisture is removed without the cauls splitting or suffering in any way. No other wood that I have seen used will stand up under the constant wetting and drying for any length of time, but basswood has all the characteristics of a blotter.

There are several practical ways of wetting the veneer. A sponge and pail may be used but that is rather a slow method. In the veneer room where the writer works we have a fairly large sink, of the kitchen variety, and we just put a stopper in it and fill it full of water. The veneer is then dipped in, in bunches, that is if it is short stock such as is used for butt joint work, and then stood on end for a short time to allow the surplus water to drain off. If it is long stock we take a few sheets together and pass it through the water the same as one does when developing a strip of films in a tray. The only long stock we put through the wetting process is stock that has to be jointed. Practically all of the short stock has to be jointed so we have to wet all of it, unless we get a log that is flat enough to be worked without wetting, which seldom occurs.

Too much Weight Harmful

The wet pieces of veneer are put between the cauls about three pieces between each two cauls being the proper number for the best results. The cauls are placed on a pair of trestles and stacked up until all the veneer is taken care of. Then a weight is placed on top to press down the veneer. It is in weighting the veneer down that a great many fellows fall down. They insist on putting too much weight on it, with the result that the veneer splits at the ends. When the veneer is well wetted very little weight is required to hold it flat. The weight of the cauls on top is sufficient to straighten out the bottom pieces and then all that is required is sufficient weight to hold down the top pieces. Great care should be taken in applying weight because if the veneer splits at the ends it requires some skill to fix it and with all the skill that may be applied the patching will still be noticeable to a practised eye.

I have seen some men wet their veneer and put it between hot cauls in a screw press, working on the theory, no doubt, that if they screwed it down tight enough it couldn't split. Then when the veneer did split at the ends they put the next lot in the press and tightened it down still tighter to overcome the splitting. A few moments thought is all that is necessary to show anybody that when veneer is wet and put between hot cauls it has to shrink. Therefore, if it is weighted down so it cannot shrink there is only one thing left for it to do, namely, split. The idea of wetting it well before drying, of course, is to make it pliable. And if it is handled properly after it has been wet it will come out as flat as a sheet of cardboard, and perfectly dry. In this condition it is a pleasure to work with it.

Of course, there are some very contrary logs of veneer, particularly the short walnut made from stumps, which is end jointed, or butt-jointed as it is usually called, and it is almost impossible to avoid splitting some of it once in a while. The real purpose of this article is to tell how the writer was able

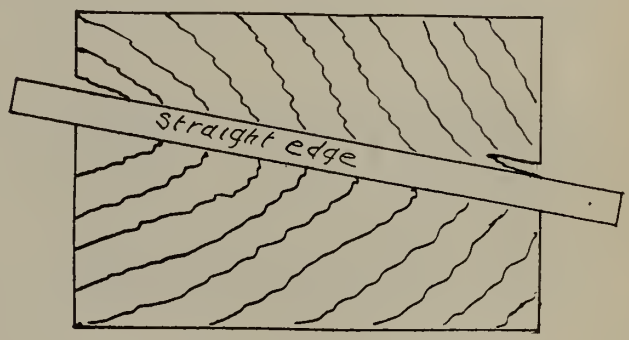

Fig. 1.

Showing how splits are cut out

to repair some of this veneer with split ends, if not so that it could not be detected, at least so that it made a very presentable job, and one that passed inspection. The sketch presented herewith will help to convey the idea.

The veneer usually splits for a distance of about four inches in from the ends, sometimes only at one end, more often at both ends. It is seldom that these splits come in line with each other. In width they are generally about one-eighth inch or three-sixteenth at the end, to nothing. We lay a straight edge from one split to the other and cut the veneer on this line. Then we place several pieces on a shooting board and joint them, taking care to joint the proper edges and taking off just sufficient to make a joint. Then we tack the veneer on boards and tape the joints. Thus we have the stock as it was, with the split removed. It differs only in that about one-eighth inch or three-sixteenths has been removed, and this is not sufficient, as a rule, to alter the figure very much or to mar the appearance of the veneer.

If there is plenty of the veneer available it would

not pay to bother patching, but that is just where the difficulty comes in, because nearly always when a short log such as I have described is cut up, it is all cut at the same time, and therefore, if any of it is split it must be fixed as it is almost an impossibility to find one figured walnut log that will match another. The writer has repaired split stock many times in the manner described and never yet got hauled on the carpet for it. Very often the joints came right on the front of a piano, and if they "got by" there, they should pass almost anywhere.

When Split Is at One End

Sometimes the veneer is split only on one end. If this is the case you can cut the piece of veneer through to the other end and keep the joint straight with the grain. This will make it a little less conspicuous than where than where the joint has to be made diagonally on account of two splits not coming in line. Sometimes if the veneer happens to be very brittle, and the writer has had it occur a number of

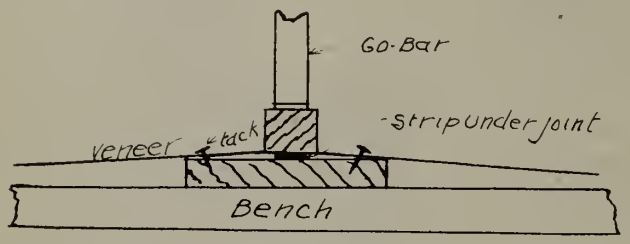

Fig. 2.

One way of makiug a good joint

times, particularly if the stock was wide, there would be as many as two, and sometimes even three, checks in each end of some of the pieces. In a case of this kind it is necessary to make two or three joints, but they can all be made at once if the pieces are numbered so they will not get mixed up.

The knowledge that checked stock can be repaired so it will pass inspection should not lead the veneer man to lessen the care he gives to his stock, because it is a slow and rather tedious job doing the repairing, and if you have to put down on your time card the length of time you have been on the job it shows up against you in the office. On the other hand there is a great deal of satisfaction in knowing that no matter what accident happens you are capable of taking care of it in a creditable manner.

Making Satisfactory Joint

To make a perfect butt joint requires a great deal of care, and they must be perfectly made if they are going to pass inspection. If they are to be made on a machine it is necessary to put a piece of thin maple, say one eighth inch stock, or something of this kind, each side of the veneer to be jointed to keep the end grain from being torn out. To make them on a shooting board with a hand plane, the plane must be absolutely as sharp as a razor and the joint must be made to conform perfectly to a straight edge.

The best butt joints I ever saw made were the work of an old mechanic that had charge of our veneer room when I started to work in it years ago. Time was, of course, no object to him and he plodded along in his own way, but he certainly could make joints and it may be of interest to readers of the "Canadian Woodworker" if I describe his system.

The way we do them is simply to make the joint and tack the two pieces of veneer on a board in the usual manner and then tape the joint. But my old friend "Jim" would have considered it an outrage to treat a butt joint in that manner. His method is illustrated at Fig. 2. Jim also jointed his veneer on a shooting board, very carefully, but it was in our methods of taping the joint that we differed so radically. He used to place a maple block about six inches wide on the bench and tack his two pieces of veneer onto it, but, before doing so he inserted a thin strip of wood about an inch wide and one eighth inch thick and as long as the veneer was wide directly under the joint. He placed the tacks about two inches from the joint. His next move was to glue the joint very carefully and then apply the paper tape. He then placed another block on top of the joint and pressed it down with "go-bars" extended up to the ceiling. Then when he had these in place he would pull out the thin strip which had been inserted under the joint. Jim claimed that it was next to impossible to get a good close joint just by shoving one piece of veneer up against the other by hand. His contention was that by first inserting the thin strip under the joint and then placing the veneer together by hand and removing the strip afterwards it was possible to force the veneer together and make a joint because the two pieces could not spread on account of the tacks.

Handling Cause of Poor Joints

Personally, I don't think he gained anything by inserting his strip because I do not think the tacks would hold the veneer from going back a shade when the strip was removed. However, Jim certainly turned out joints that could not be criticised and it may be that there was something in his method. I pass the information on for what it is worth. My own opinion is that a great deal of the trouble caused by joints opening up slightly before they are laid on the core stock is due to carelessness in handling the veneer. I contend that veneer that has been butt jointed should be placed flat on a board as soon as it is taped and it should remain there until it is laid on the cores. Instead of that one often sees it handled very carelessly, the joint being opened up, using the tape for a hinge. That is why I think Jim's success was due more to his careful handling of the veneer after it was jointed than to his method of taping.

I never worked in a plant where they had a redrier but I have seen them in operation and they look to me like an ideal piece of equipment. It seems to me they would eliminate all the trouble of wetting veneer and then they would not split the ends, thus making patching unnecessary. As I say they are undoubtedly a fine machine and any plant that has enough veneer to dry to keep one in operation, even half the time, should, in my judgment, have one. In our plant, however, we would not have enough work to keep one operating more than about one day a week and I think there must be some other concerns similarly fixed. It is for them I have contributed some of the methods I have found to work successfully in actual practice on butt joint stock, and with the exception of crotch mahogany I think it is the most difficult stock to handle that finds its way to the veneer room.

Some cotton belts would make good weather gauges. They lengthen in dry weather, and become tight in dry.

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THE OHIO VENEER COMPANY

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Foreign and Domestic Veneers and Hardwood Lumber

We always carry a large and assorted stock of Mahogany, Circassian Walnut, Sawed and Sliced Quartered Oak.

Send us your enquiries and orders. We guarantee good service.

2624 to 2644 Colerain Avenue, - - CINCINNATI, OHIO.

Mahogany and Walnut Veneers

Veneer department at New Orleans, La., showing 10-ft. Rotary and Clipper and 16-ft. Slicer in rear.

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Saw and Veneer Mills:
NEW ORLEANS - LA.

Mahogany Importers and Manufacturers

Western Office, 516 Lumber Exchange, MINNEAPOLIS, MINN. Mills at GLADSTONE, MICHIGAN

The Northwestern Cooperage & Lumber Co., Gladstone, Mich.

THE HOME OF "PEERLESS" STANDARD BRAND PRODUCTS

Manufacturers of

"PEERLESS" ROTARY CUT VENEERS

in Birch, Elm, Basswood, Maple, Ash and Beech for all purposes

Also hoops, liners and staves for manufacture of packages

Also "Peerless" Rock Maple, Beech and Birch flooring; Hemlock lumber; Lath, etc.
"Peerless" products are standard everywhere and you are always exercising Safety First in using them. Try us next time.
(When writing mention Canadian Woodworker)

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

SAVE FREIGHT

Rotary Cut Birch and Gum

Why pay freight on gum veneers from southern points when our cutting mill is so near the border.

PANELS

We manufacture Tops, Fronts and Panels of all kinds

Ask for our "Ready to Ship" Stock List

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Warren. Pa.

Plywood Dept. Warren, Pa.

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Manufacturers

American Walnut, Figured Gum, Sliced Quartered Oak, and all Kinds of Figured Woods

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Office and Mill

ROCKFORD - ILLINOIS

J. W. Frye Lumber and Veneer Co.

Dayton - Ohio

Manufacturers and Wholesalers

Specialize in

Walnut Lumber and Veneers

Oak Lumber and Veneers

Also All Native Hardwoods

Guarantee all stocks to be Ohio and Indiana grown

ESTABLISHED-1867 HB INCORPORATED-1904
Reg. U.S. Pat Off.

THE solid success which has attended this company's half century of business is attributable to its having established high ideals through direct personal contact with its customers. During the current period of transition, many buyers may have difficulty in establishing satisfactory supply connections for strictly high-grade hardwood lumber and veneers. May we suggest that through personal contact we are confident of our ability to demonstrate that our selection of genuine northern grown oak, walnut, maple, ash and other major species, and our rotary cut poplar, is sufficiently varied to prove a genuine asset to any discriminating buyer, and that this concededly superior product is just as good to day as was the original stock manufactured on the same site fifty or more years ago. Surely it will pay you to know us better.

HOFFMAN BROTHERS CO.
FT. WAYNE, INDIANA

·LIVEZEY·

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

Poplar and Walnut

Veneers

We specialize in large size poplar veneers as we have extra fine poplar logs. We can cut veneer up to 10 feet square.

Our walnut veneer cannot be beat, both in plain and figured wood.

Write us for prices.

Central Veneer Company
Winter Ave. and Belt R. R., INDIANAPOLIS, IND.

Sovemanco

Southern Veneer Manufacturing Co., Inc.
LOUISVILLE, KY.

Importers and Manufacturers of all kinds of Sawed, Sliced and Rotary-cut

VENEERS

CARRYING

a large stock of selected Mahogany, Figured and Plain Walnut, Walnut Butts, Sawed and Sliced Quartered Oak and Sycamore and all other native woods.

1,000,000 Feet
QUARTERED RED GUM
to select from

WE Respectfully solicit your inquiries

MAINE BIRCH VENEERS

THE BEST IN THE WORLD

The Standard Veneer Co.
Portland, Maine

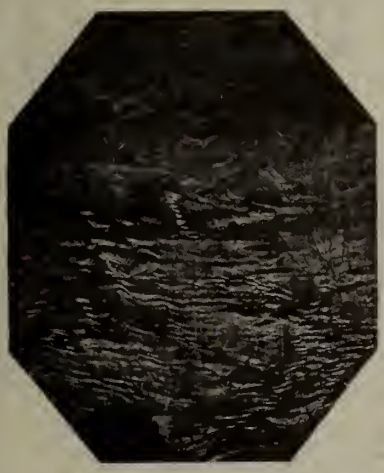
Wide Veneer

One carload of 1/20″
Quartered White Oak
Sawed Veneer
12″ and wider

Ready for Quick Shipment.

Memphis Veneer & Lumber Co.
MEMPHIS, TENN.

The Bachman Plant —and the Bachman Product



A sample of beautifully figured Walnut Stump Wood

Here, in this large and fully equipped plant, Bachman quality veneers are made. Our extensive yards are piled high with carefully selected, choice Indiana White Oak, Walnut and Gum.

Bachman veneers are cut full thickness, which means plenty of wood for sanding and a minimum of breakage in handling.

Bachman's forty years' experience in hardwood sawing is evidenced in every piece of veneer that leaves the plant. The sawed stock can scarcely be told from the sliced.

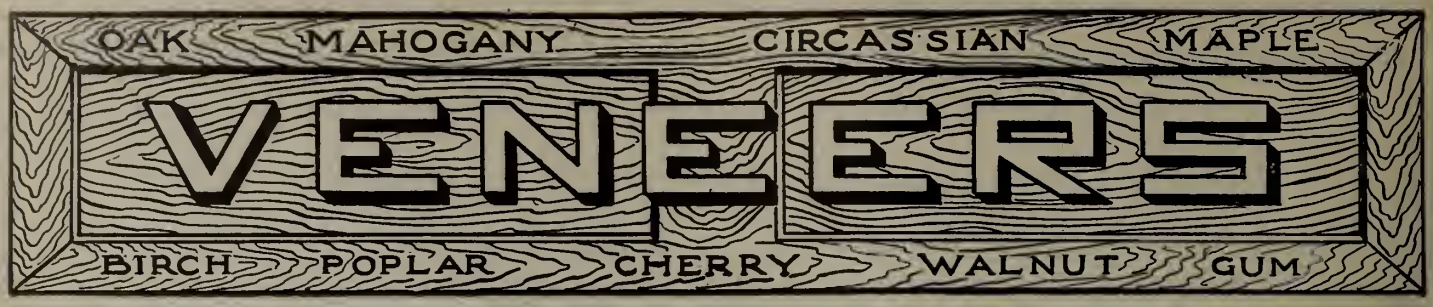
These are a few of the reasons why our customers tell us they get *fifty per cent. more panelling out of Bachman veneers* than they can from average veneers.

It is this unchanging high standard, both as regards materials and workmanship, that has made possible forty years of successful business. It is your assurance of the utmost in quality and service.

No order is too small to receive our prompt and careful attention—none too large to be handled to your entire satisfaction.

F. M. BACHMAN COMPANY

Indianapolis



INVESTIGATE

P.-J. SERVICE

For high-grade rotary cut veneer, that is smooth and evenly cut and dried by mechanical means to any percentage of moisture desired.

We also operate large band mills where all kinds of southern hardwood lumber is cut from our own tract of timber in the very heart of the Saint Francis Basin District, Arkansas.

PENROD-JURDEN COMPANY

A Name that Should be on your Enquiry List for both Veneer and Lumber

Mills at Helena and Penjur, Ark. General Offices: Memphis, Tennessee.

Penrod Walnut and Veneer Co.

KANSAS CITY, MO.

Exclusive Manufacturers American Walnut Lumber and Veneers

AMERICAN BLACK WALNUT LUMBER

FAS—6-9¼" Wide, 8-16" Long

3/8"	3,750 Feet
1/2"	21,470 "
5/8"	44,140 "
3/4"	25,962 "
4/4"	82,502 "
5/4"	26,766 "
6/4"	39,201 "
8/4"	33,140 "
10/4"	14,245 "
12/4"	11,470 "
16/4"	3,700 "

FAS—10" and Up Wide, 8-16" Long

1/2"	9,680 Feet
5/8"	18,980 "
3/4"	14,430 "
4/4"	48,872 "
5/4"	14,165 "
6/4"	10,262 "
8/4"	16,920 "
10/4"	10,250 "
12/4"	1,800 "
16/4"	2,100 "

Fas—6"and Up Wide, 6-7 Feet Long

3/8"	1,200 Feet
1/2"	5,790 "
5/8"	840 "
3/4"	8,940 "
4/4"	32,400 "
5/4"	2,300 "
6/4"	7,800 "
8/4"	1,500 "
10/4"	1,400 "
12/4"	500 "
16/4"	400 "

SELECTS

4/4"	32,940 Feet
5/4"	27,530 "
6/4"	21,480 "
8/4"	33,590 "
10/4"	16,850 "
12/4"	6,054 "
16/4"	1,332 "

NO. 1 COMMON

3/8"	8,000 Feet
1/2"	27,380 "
5/8"	29,850 "
3/4"	31,285 "
4/4"	59,675 "
5/4"	38,240 "
6/4"	18,750 "
8/4"	39,240 "
10/4"	16,363 "
12/4"	4,768 "
16/4"	1,604 "

NO. 2 COMMON

3/8"	1,500 Feet
1/2"	1,900 "
5/8"	4,500 "
3/4"	2,190 "
4/4"	72,250 "
5/4"	47,890 "
6/4"	31,720 "
8/4"	35,940 "
10/4"	19,140 "
12/4"	20,116 "
16/4"	16,088 "

Write for prices on any items you are interested in *"PENROD SERVICE" Satisfies*

C. A. Rugg, 115 Foots Avenue, Jamestown, N. Y., Eastern Representative.

Geo. C. Hall, 610 South Michigan St., Representative for Chicago and Michigan territory.

OAK MAHOGANY CIRCASSIAN MAPLE

VENEERS

BIRCH POPLAR CHERRY WALNUT GUM

VENEER MANUFACTURERS COMPANY

PANELS! VENEERS! OF ALL KINDS

Our Chicago Warehouse is filled with the largest and most complete line
ROTARY CUT FIGURED AND PLAIN VENEER SLICED AND SAWN
FIGURED VENEER PANELS

Write us for Prices and Details

OUR REPUTATION

For Quality —Service—and Fair Dealing Stands Approved

Watch for The Veneer Price-Stock List.

1036 W. 37th. St. Chicago, U. S. A.

QUALITY *SERVICE*

PICKREL VENEER COMPANY, Inc.

MANUFACTURERS OF

American Walnut

Exclusively

Woodruff and River *New Albany, Ind.*

Quality Veneers

Photo by Hughes

Baltimore Offices & Sample-Rooms

THIS building stands directly opposite and convenient to the mill buildings. The studio windows on the second floor give a fine light for the inspection of samples. We also maintain large, bright show-rooms and sales-offices in the following cities:

NEW YORK ~ 709 6th. Ave. HIGH POINT, N.C.
CHICAGO ~ 28 E. Jackson Blvd. JAMESTOWN, N.Y.

WALNUT BUTTS • MAHOGANY • BURLS • OAK • POPLAR • LONG WALNUT

THE WILLIAMSON VENEER CO.

ALGOMA *the Better* Plywood

"A Merry Christmas!"

To all the readers of all the magazines which carry this message—to our new friends and our old friends —to those who use Algoma Plywood and those who will sometime decide to use it—we say with all our heart these three old words—"A Merry Christmas!"

For months we have told you of Algoma Plywood —how it is glued and seasoned; sanded and cut; inspected and shipped; with the constant desire that it shall be Better Plywood.

Let us now put business aside and extend the sincere good wishes of the season which has symbolized good will toward men for over nineteen centuries.

ALGOMA PANEL COMPANY, *Algoma, Wis.*

Time and Temperature in Redrying

Within Certain Limits Higher Temperatures Shorten Drying Time—High Temperatures not Advisable—All Veneers Should be Redried

By ED. HUXLEY

One bit of philosophy that may be applied to redrying, perhaps even more positively than to original drying, is that we can shorten the time by using higher temperature. But this raises an interesting question of probable harm resulting through efforts to cut down the time of redrying through using it. There is some evidence coming forward that high temperature in drying may work harm to veneer, especially if it has not been pretty thoroughly dried, or, we might say, properly dried, before it comes to the redrier. If caretul experiments show that high temperature in redrying to save time damages the wood, then it is time to call a halt on it, and if necessary use more time, so that we may be sure of good results.

Drying of wood, whether it is primary drying or redrying, consists essentially in removing moisture. This, the experts say, involves first the drawing out of free moisture, and second, in removing the moisture wedged in, so to speak, in each void of the wood or among the fibers of the wood. The agencies for accomplishing this are heat and ventilation, or air movement.

High Temperature Dangerous

Experience in both drying and redrying brings evidence that there is a limit to temperature, but mean time there is a wide range of possible differences. The temperature in lumber drying ranges from 100 to above 200 deg. Fahr.., and some times a fairly wide range is used in drying the lumber, being varied during the different stages of the process of drying. Other variations are necessary because of difference in the character of the timber, it being necessary to use more time and less temperature on some close-knit timber, and so it goes. When it comes to redrying we have a condition somewhat different from primary drying, because presumably the stock has been dried once, and not only relieved of what is termed free moisture, but also part of the other moisture. In short, the redrying is simply to give the final touches, and perhaps because of this, we sometimes grow careless and fail to realize that it should be handled with the same care exercised in primary drying.

There enters incidentally the question of practicality of making the redrier serve as as a primary drier—that is, to take stock which has not been properly dried and put it in shape for use. This seems to be a matter to consider separately, yet there are times when it will intrude itself even in the plant where the main call for the redrier is to complete the drying on stock which has once been fairly dried.

I recall, in this connection, some practices with the old-time hot-plate driers, which evidently led to the modern redrier. We had a series of hot plates suspended in a frame, with levers and toggles to open and close them, and these were piped with steam. That is, they were hollow plates, made smooth on each side and with a steam cavity through which to do the heating. We only carried a nominal pressure on these; in fact, it was not pressure that was sought, but merely the temperature of the steam, and reducing valves were used, which kept it down to a very few pounds. The 40 to 75 lbs. spoken of to-day, used in hot-plate redriers, would probably have exploded every plate in the old-time hot press.

Material Can Be Dried in This Way

We used these hot plates primarily for flattening out and redrying thin veneer for plywood, which had been dried in the kilns and air, and in many instances had wrinkled. It was given a final drying out between the hot plates just prior to going into the glue room. Now and then we varied this, however. There would come a hurry order, and there are cases on record where we pulled the blocks into the plant in the morning, cut them into veneer, dried the fresh, wet veneer in these hot-plate presses, sent it to the glue room, glued it into plywood panels, trimmed the panels and had them uptown inside of forty-eight hours, and sometimes even short of that.

Admittedly, that was not good practice, and it would be justly frowned on to-day, but so far as the work of drying is concerned the hot plates seemed to have performed their duty nobly. We were able by the use of them to dry veneer in a matter of a few minutes, or a half hour at the outside, which ordinarily would have taken a night in the kilns or along period of time in the warehouse. This would seem to demonstrate that it is practical to take the same equipment that is primarily designed for redrying and make it do the primary drying of stock. It is not advisable to do this, because there are other drying methods which are more economical and satisfactory, but in an emergency it should be practical.

What seems to be the point needing the most thoughtful attention now, in connection with hot-plate redrying, is that of the amount of temperature. If too much steam pressure does damage to the wood it is time for us to be carefully experimenting and charting this matter of temperature so that we may understand positively how much to use on a given kind of wood under any given condition.—"Veneers," Indianapolis.

100% EXCELLENCE

Manufacturing
High Grade ROTARY CUT VENEERS
Specializing BIRCH DOOR STOCK,
MAPLE PIANO PIN BLOCK STOCK

Years of Experience Behind Our Products

The Munising Woodenware Co.
MUNISING, MICH.

EARLY 1922 will require the unusual in lumber deliveries. No service can then be more helpful than our 500,000 feet capacity, specially designed dry kilns. Frequent scientific tests on many millions of feet already dried show without exception absolutely correct results. Splendid transit arrangements make these kilns available to all markets. With this service we offer our famous lumber and veneers, the lumber in plain and quartered white oak, walnut and the other hardwoods; the veneer in quarter sawed white oak, sliced and rotary cut walnut, rotary cut yellow poplar crossbanding.

WOOD-MOSAIC COMPANY
LOUISVILLE INCORPORATED KENTUCKY

New Machinery Organization Formed

The Garlock Machinery Limited, were incorporated recently to take over the assets and organization of the Garlock-Walker Machinery Co., now in liquidation. The assets of the Garlock-Walker Machinery Co. were purchased on the basis of 100 cents on the dollar to all creditors, a certain amount of time being allowed, the Garlock Machinery Limited to realize on some of the stock. The main reason for the downfall of the older organization was dissension among the principals.

Mr. Garlock has a wide connection in the woodworking field and has a well-founded grasp of the requirements of this industry. He has been selling woodworking equipment since 1906 and since 1913 his efforts have been confined entirely to the Canadian field.

Included among the directors of Garlock Machinery Limited are G. W. Boake, of the Boake Mfg. Co., and T. H. Hancock of T. H. Hancock, Limited, Toronto.

Hints on Brazing Band Saws

Cut the saw behind a tooth and at right angles to the back. Do not allow the joint to be any longer than, say, 9/16 in., and do not grind the lap down too thin. See that the saw is jointed so that it will follow on to the wheels, not to meet them. Clean the laps with emery-cloth, then finally with muriatic acid. Use flat strip solder a shade wider than the lap, this also being cleaned and rubbed with acid.

The correct heat to employ in brazing is not too bright a cherry-red, and use a solution of borax as a flux, letting this be as fresh as possible. Wipe off any surplus borax on the joint with a piece of clean paper. Do not be too prodigal with the flux, as an over-indulgence in this direction is often responsible for a soft joint. The brazing irons should not be above ¾ in. thick.

After the joint is made, and the saw cooled down to a black heat, pour ordinary lubricating oil over it, clean off with sawdust, and then smooth up with emery-cloth. If it is desired to further draw its temper, lift the joint clear, and pass under it a piece of flat iron made red-hot, and watch until the saw shows a uniform dark straw colour; then at once remove the source of heat.

Finally, take out of the saw all lumps or twists, straighten it out, correct the tension and back, and smooth up lengthwise with a fine file and emery cloth.

Boosting Your Own Product

An example of reciprocity between the accounting and sales department of a woodworking organization was encountered recently. The accounting department of this plant encloses a small printed slip with every cheque they send out in payment for goods. This slip reads as follows:—

Your Attention, Please.

This cheque pays for goods purchased of you. We manufacture doors, sash, moulding and general woodwork. Anytime you require any of these products let us have your inquiries. Please pass this slip to your purchasing agent.

While it is not possible to check up any direct results from this idea, yet those behind it feel sure that they are benefiting indirectly at least, by the use of this slip and at a very small cost.

Care in Pouring Babbitt

In pouring hot babbitt on to cold metal or wet surfaces, there is always danger of the hot metal spitting and flying in all direction and thereby causing painful and at times serious burns. The same holds true if anything cold is dropped into a pot of molten metal. It is, therefore, wise to warm and dry both the journal and shaft before attempting to pour the babbitt. If a ladle is used, it should be warmed slightly before being dipped into the hot metal. These simple "safety" precautions may be the means of preventing a "spit" which might have serious results.

Calculating Linear Speed of Saws

A correspondent, writing from Norwich. asks us to inform him how to calculate saw speed in linear feet per minute when the revolutions of the saw spindle are known. Also what is a good general speed for circular saws.

This is not a very difficult matter. First ascertain the circumference of a saw from its diameter, this being done by multiplying the diameter of the saw in inches by 3.14, or the fraction 22/7. This multiplied by the revolutions per minute and divided by 12 gives the answer in linear feet.

Thus, by way of example, suppose that we desire to know the linear speed in feet per minute of a saw 40 in. in diameter, running at 980 revs. per minute. Then—

$$40 \times 3.14 \times 980 \div 12 = 10{,}257.$$

It is generally assumed that a periphery or rim speed of 10,000 ft. per minute will suit most saws, taking the class of timber as it usually runs in a general woodworking shop.

The following table showing the revolutions per minute required to be reached with saws of various diameters in order to give a uniform peripheral speed of 10,000 ft. per minute, might be of some assistance to our correspondent as well as to other readers:—

Diameter of Saw.	Revs. per Minute.
12 in.	3,260
16 "	2,450
20 "	1,960
24 "	1,630
28 "	1,400
32 "	1,225
36 "	1,080
40 "	980
44 "	890
48 "	815
52 "	750
56 "	700
60 "	640
64 "	600
68 "	560
72 "	530

This table allows a small percentage of slip, which in a general way is inevitable. Thus actual calculations would give, as our example shows, a speed of 10,257 ft. per minute for a 40 in. diameter saw running at 980 revs., whereas actually, taking into account the slip of the belt, a speed of no more than 10,000 ft. per minute might be reached.

A sectional chip breaker on a planer is a great help in working up small work.

Toronto Veneer Company Ltd.

(Operating Panels, Limited, Southampton, Ont.)

Office and Veneer Warehouse:
1100-1104 Queen St. West
Toronto

Lumber Yard:
Atlantic Ave. and G.T.R. tracks
Toronto

PATENT "RIM-BOUND" TABLE TOPS

Five Ply Table Rims

PANELS 3 AND 5 PLY IN ALL WOODS.

MAHOGANY AND WALNUT, QTD OAK VENEERS Plain Rotary Veneers always in stock

TORONTO LUMBER STOCKS

MAHOGANY

20,000′	4/4	1s & 2s
14,880′	4/4	No. 1 Com. & Sel.
3,065′	5/4	1s & 2s
3,136′	5/4	1s 1 Com. & Sel.
6,045′	6/4	1s 1 Com. & Sel.

BLACK WALNUT

26,485′	4/4	x 10″ /up 1s & 2s
32,265′	4/4	x 6-9¾″ 1s & 2s
17,584′	4/4	No. 1 Com. & Sel.
12,762′	5/4	1s 2s
14,407′	5/4	No. 1 Com. & Sel.
13,383′	6/4	1s & 2s
13,269′	6/4	No. 1 Com. & Sel.
13,824′	8/4	1s & 2s
12,970′	8/4	No. 1 Com. & Sel.

WHITE WALNUT

284′	4/4	1s & 2s
255′	4/4	No. 1 Com. & Sel.
171′	4/4	No. 2 Com.

SOFT YELLOW POPULAR

21,288′	4/4	1s & 2s
30,924′	4/4	Saps & Select
9,825′	4/4	No. 1 Common
12,752′	5/4	1s & 2s
8,600′	5/4	Saps & Select
6,447′	5/4	No. 1 Common
4,762′	6/4	1s & 2s
2,951′	6/4	1s & 2s
6,736′	6/4	No. 1 Common
4,426′	8/4	1s & 2s
7,838′	8/4	Saps & Select
4,207′	8/4	No. 1 Common
2,012′	10/4	Select
7,047′	10/4	No. 1 Common
4,195′	12/4	1s & 2s
3,081′	12/4	Saps & Select
4,558′	12/4	No. 1 Common

QUARTERED WHITE OAK (Soft Indiana)

15,968′	4/4	1s & 2s
28,053′	4/4	No. 1 Com. & Sel.
15,000′	4/4	x 2½-5½″ Clear Strips
14,431′	5/4	1s & 2s
34,500′	5/4	No. 1 Com. & Sel.
11,320′	6/4	1s & 2s
17,000′	6/4	No. 1 Com. & Sel.
11,430′	8/4	No. 1 Com. & Sel.

PLAIN WHITE OAK (Soft Indiana)

25,020′	4/4	1s & 2s
13,431′	4/4	No. 1 Com. & Sel.
12,955′	5/4	1s & 2s
12,975′	5/4	No. 1 Com. & Sel.
12,974′	6/4	1s & 2s
12,505′	6/4	No. 1 Com. & Sel.
12,185′	8/4	1s & 2s
12,288′	8/4	No. 1 Com. & Sel.

QUARTERED RED OAK(Soft Indiana)

22,684′	4/4	1s & 2s
9,139′	4/4	No. 1 Com. & Sel.
3,688′	4/4	No. 2 Common

PLAIN RED OAK (Soft Indiana)

13,035′	4/4	1s & 2s
21,124′	4/4	No. - Com. & Sel.
12,425′	5/4	1s & 2s
12,795′	5/4	No. 1 Com. & Sel.
9,778′	6/4	1s & 2s
10,365′	6/4	No. 1 Com. & Sel.
12,090′	8/4	1s & 2s
14,300′	8/4	No. 1 Com. & Sel.

PLAIN RED GUM

17,672′	4/4	No. 1 Com. & Sel.
9,247′	6/4	No. 1 Com. & Sel.

PLAIN SAP GUM

18,000′	4/4	x 13″ /up 1s & 2s
18,000′	6/4	1s & 2s

QUARTERED RED GUM

21,370′	6/4	1s & 2s
12,329′	6/4	No. 1 Com. & Sel.

QUARTERED RED GUM S. N. D.

15,198′	4/4	1s & 2s
8,160′	5/4	1s & 2s
8,969′	8/4	1s & 2s

We are prepared to quote attractive prices on the above, and if required, can kiln-dry and dress any of this to your order.

We are prepared to quote on anything in Hardwoods for shipment direct from the mills in car lots, and solicit your inquiries. We are cutting Gum, Chestnut, Walnut and Mexican Mahogany, and have dry stocks at Jackson, Tenn. and Indianapolis, Ind.

The Lumber Market

Domestic Woods

The hardwood lumber market is at the present time seasonably quiet as December is usually a month when purchasing falls off except in such consignments as are required for immediate consumption. Woodworking establishments generally defer buying until the first or second month in the new year when they are able to gauge prospective conditions. It is also the general practice to have as low a stock as possible at the end of the year in order to make as good an inventory showing as possible. During the next two or three weeks most plants will be busy stock-taking and getting ready for the activity expected during 1922.

The outlook is considered more promising as each week goes by and this is reflected in the fact that considerable blocks of stock are changing hands, one leading wholesaler purchasing over two million feet of birch (No. 2 common and better) during the past fortnight. Another dealer purchased over a million feet and several smaller sales have taken place. This shows that the wholesale trade is gaining confidence so far as the future is concerned, and, after a long period of hesitation, things are beginning to move in the right direction. Several hardwood firms, who have a considerable quantity of 1sts and 2nds and selects and No. 1 Common on hand, are holding on to their stock unless they get the price asked. They are certain that there will be no decrease while every tendency is in the opposite direction.

With anything like normal buying, it is predicted there will be a shortage in both domestic and imported hardwoods, and particularly so, in view of the decreased operations of the past season and the limited logging activities of this. Whether the demand will get back to normal within the next few months, it is difficult to tell, but certain it is, that requisitions are coming in from all sides, asking for bids on various quantities and grades. The buyers are interested and are not disposed to call quotations into question as much as they were a few months ago.

While 1922 may not be a record year in either woodworking or lumbering, it is felt that the progress from this on will be satisfactory, and if production and prices can be stabilized, more comfortable feeling will develop. Housing commissions, large contractors and others are planning to undertake home building on an extensive scale during 1922, believing that prices have struck bottom and construction operations can be carried on now with a reasonable outlay. This, in itself, is a hopeful sign. As the season advances, indications are that industrial activity, now showing every evidence of improving, will further increase and will help to make 1922 a year marked by a larger trade, better prices, continuity of production and quicker turn-over than was manifested during the period now drawing to a close.

Imported Woods

The consensus of opinion is that the present is a good time in which to buy lumber. Not only is there the possibility and even probability of prices going still higher but shipments to-day are in excess of production which means only one thing, lower stocks. Those closest in touch with the situation predict that lumber will be a scarce item practically all next year and that prices higher than those which hold to-day are assured. By entering the market to-day the wood user is sure of a better assortment, though the majority of the holdings in the hands of lumber manufacturers are badly broken, from which to make his choice and will have the satisfaction of buying at a comparatively low price. The National Lumber Trade Barometer, published by the National Lumber Manufacturers' Association shows that during September orders were 79 per cent of normal while for the same month production was only 71 per cent of normal. This is taken to indicate that buying is increasing more rapidly than production. Since last month's report there have not been any marked changes. A state of equilibrium seems to have been reached for which no new gains have been recored by the upper grades, yet the advances which occurred some weeks ago are being held. The lower grades have responded to the impetus which recently strengthened the upper items, with the result that certain of the cheaper lines have advanced in price. As it will be some time before any increase in production which is taking or may take place, can effect the market, it is believed that present values will be held during the holiday lull and that any changes which occur will be upward.

Memphis, Tenn., Values are holding firm in this centre, though the demand is a trifle spotty. This is due, partially at least, to the fact that export buyers have withdrawn from the market. It may be that some buyers are holding back in the belief that prices will recede again. This view is not held by those in a position to judge. It is thought that higher prices will be the order of the day. The furniture industry is particularly active and is taking considerable quantities No. 1. C. & B., gum and oak, together with some No. 2.C. Strenuous efforts are being made by many manufacturers to increase production but conditions in the woods, heavy rainfall, are proving a decided handicap.

Louisville, Ky., Demand continues active with a tendency toward still higher prices. Production higher but still below demand. Practically all woods are active. Walnut in good demand. Low grade stocks are commencing to move. Any holiday lull which may occur will not affect the market for it will merely enable the producers to sort up their stocks.

Buffalo, N. Y., Trade in the Buffalo market is very satisfactory. This is the consensus of reports received. Prices have advanced as high as $20.00 on certain items. A survey of this district does not indicate any large accumulations of stock. Here as in other centres values are expected to advance still more before spring The furniture manufacturers are doing considerable buying as well as other wood-using industries.

Unionism up-to-date

"What are you doin' of, James?"

"Sharpenin' a bit o' pencil."

"You'll 'ave the union after you, me lad.
That's a carpenter's job."

The war was not won by retreating; neither can busines be secured by retrenching.

Walnut, Quartered White Oak and Mahogany Veneers and Lumber

Prompt Delivery

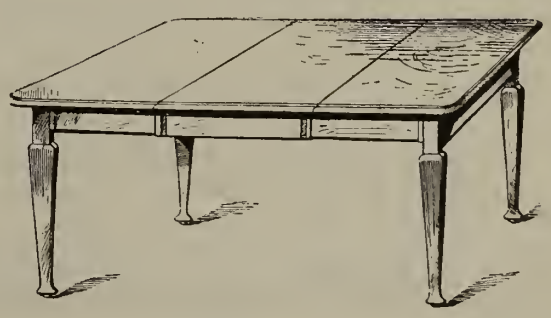
LONG-KNIGHT LUMBER COMPANY
INDIANAPOLIS, IND.

VENEERED TABLE TOPS

WALNUT - MAHOGANY - QUARTERED OAK

PROMPT delivery in any quantity at very attractive prices. Just let us know your requirements and we shall be glad to forward quotations.

Panels are made in Walnut, Quarter Oak, Birch, etc. Large sizes (72x24; 60x30; 60x24; 56x25; 60x20; 60x18; 48x18) carried in stock at all times.



HAY & CO., Limited Woodstock, Ont.

News of the Trade

Geo. Walkey has purchased a planing mill at Harriston, Ont.

Sir F. Orr-Lawis, president of the Canadian Vickers, Limited, Montreal, recently passed away.

T. Clements, manufacturer of toys, Toronto, has been succeeded by the Earlscourt Toy Works, Ltd.

Moore Bros., 23 Wayland Ave., Toronto, are installing a C. M. C. single spindle ball bearing sharper.

The Montreal Cabinet Works, were recently registered with S. Adler and B. Karasinsky as proprietors.

Thomas S. Lawrason has taken over the plant and assets of the Brockville Furniture Co., Brockville, Ont.

Fire recently caused $3,000 damage in the factory of Castle & Sons, furniture manufacturers. Montreal.

The plant of the New Method Broom Co., 350 Pacific Ave., Winnipeg, Man., was recently destroyed by fire.

The Beaver Lumber Co., Ottawa St., Hamilton, Ont., are erecting a small woodworking shop at a cost of $2,000.

L. J. Laurendeau, E. Laurendeau and T. Ferguson, Montreal, have been registered as woodworkers and pattern makers.

L. S. Bell & Co., Montreal, were recently registered as manufacturers of last blocks, with Mrs. Lorne S. Bell as proprietor.

Langslow, Limited, Cobourg, Ont., are adding a C. M. C. double end tenoner and a C. M. C. belt sander to their equipment.

The National Wood Turning Co., was recently registered at St. Alexis des Monts, P. Q. with J. A. Chicoine as proprietor.

The Windsor & Walkerville School Boards, Windsor, Ont., are calling for tenders for a new technical school to cost $450,000.

The Globe Furniture Co., Limited, Waterloo, Ont., has been given the order for seating for the new Temple Baptist Church, Montreal.

The partnership known as the B. & D. Toys Mfg. Co., Montreal, P. Q., has been dissolved, and Jules J. Dupras is now the registered proprietor.

Heintzman & Co., Limited, Toronto, piano manufacturers, recently sold one of their upright grands to the First Presbyterian Church of Detroit.

It is reported that the Builders' Exchange of Montreal is considering holding a Building Supply and Furnishing Exhibition in that city early in 1922.

N. Roy Firstbrook, Firstbrook Bros. Limited, Toronto, recently completed a course in boxing and crating at the U. S. Forest Products Laboratory, at Madison, Wis.

The Canadian Wirebound Boxes, Limited, Toronto, are calling for tenders for the erection of from twenty to thirty bungalows at an approximate cost of $6,000. each

The Beaver Truck Co., Limited, Hamilton, Ont., contemplate erecting an addition to their factory to cost $50,000. It is expected that tenders will be called for early in the year.

The Milverton Furniture Co., Milverton, Ont., have purchased a steam heating plant from a factory at Wiarton, Ont., and are installing it in their furniture manufacturing plant.

C. W. Meakins, of the Meakins Brush Co., Monteal, accidently shot and killed himself, recently, while handling a loaded gun. He was 62 years of age and lived at Pointe Claire.

Kent, McClain, Limited, Toronto, manufacturers of showcases and store fixtures, recently purchased a Preston veneer jointer and a Preston (Black Bros.) veneer taping machine.

Garlock Machinery Limited, Toronto, were recently incorporated with a capital of $250,000., to carry on a general machinery business dealing in wood and iron-working equipment.

Berwick Cooperage Co., Berwick, N. S., has closed down their milling operations in East Dalhousie. The output during the past six months has been 150,000 feet of lumber and 1,000,000 staves.

Malcolm & Hill, Limited, Kitchener, Ont., find business exceptionally good at the present time. They are running six days a week and some overtime in an effort to clean up the work on hand.

Latour & Dupuis, Inc., St. Johns, P. Q., have commenced work on a sash and door factory and planing mill. The building is to be two storeys 85 x 140 feet, to cost in the neighborhood of $30,000.

Leslie & Harding, Georgetown, Ont., contemplate rebuilding their basket factory which was recently destroyed by fire. The cost of the proposed factory will be in the neighborhood of $10,000.

Harry Rankine, chief millwright and one of the oldest employees of Fraser Companies, Ltd., had his left hand amputated while working on a splitter saw at the Victoria Mill in Fredericton, N. B.

R. McFarlane & Co., Limited, St. James St., Monteal, were the successful tenderers of millwork for the bank and office building being erected by the Canadian Bank of Commerce at Westmount, P. Q.

W. W. Avey, Norwich, Ont., contemplates erecting a new planing mill. A by-law is to be submitted to the ratepayers on January 1st, authorizing the granting of a fixed assessment on this property.

A. H. Leake, provincial inspector of manual training departments in Ontario, states that the manual training department in connection with the Memorial School, Hamilton, Ont., is the best in the province.

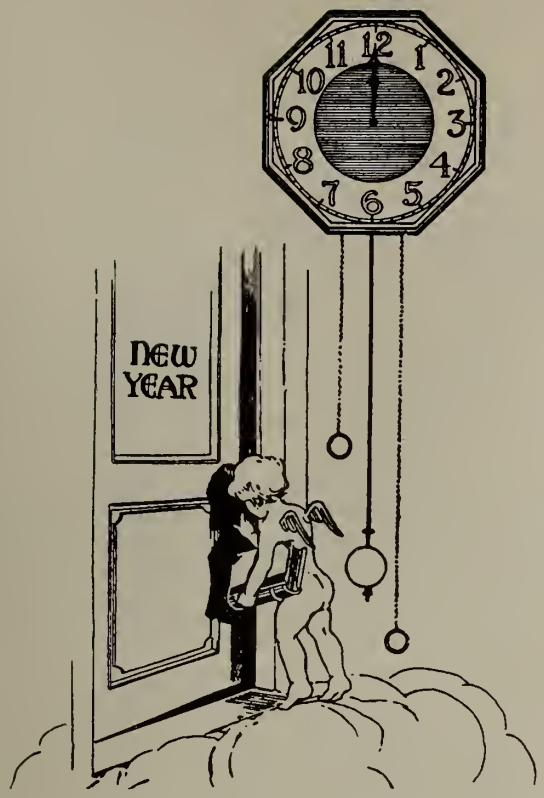
The F. E. Coombe Furniture Co., Limited, Kincardine, Ont., are considering an extension to their plant. A by-law, covering this proposed improvement, will be submitted to the ratepayers shortly.

The Ontario Show Case Co., 321 King St., W. Toronto, are putting in the foundations for a new manufacturing building at 624-6 King St, W. The structure will be of steel and brick and will cost about $50,000.

The Universal Casket Co., Limited, Dunnville, Ont., was recently incorporated to manufacture and deal in caskets of all kinds, capital $2,000,000. The provincial directors include Byron Bascue and Robert Bradford, both of Dunnville.

J. F. Hirt, vice-president of the Forest Products Engineering Co., Chicago, was in Stratford, Ont., recently in connection with the work the Forest Products Engineering Co., are doing in the plant of the Stratford Chair Co.. Limited.

A charter has been granted to the Hastings Mfg.



Resolve Now—

that you will "Ask Questions about International Time Recorders and Job Time Recorders for greater Production during 1922"

Such a Resolution will earn dividends.

International Business Machines
SPEED
ACCURACY
ECONOMY

International Business Machines Co.

LIMITED

F. E. MUTTON, Vice-President and General Manager

Also manufacturers of International Dayton Scales and International Electric Tabulars

Made in Canada

Co., with a capital stock or $40,000., to manufacture and deal in toys. The headquarters are in Toronto. Among the incorporators are Joseph Horchover, Samuel G. Cregeen and Peter Rudick.

George Walton recently passed away at his home at Belleville, Ont. Mr. Walton was a well-known woodworker, having conducted a sash, door and general woodworking factory for a number of years. He retired from active business three years ago.

The Patrucci Freres, Limited, Montreal, were recently incorporated with wide powers, among others to manufacture and deal in picture frames and church furnishings; capital $149,000. A. Mathieu and A. Viau, of Montreal, are two of the incorporators.

Elliot & Elliot, Windsor, Ont., were recently organized to handle lumber and wood products of various kinds chiefly B. C. forest products. This firm has been appointed to act as eastern representatives for the Pacific Box Co., Limited, Vancouver, B. C.

F. E. Hollingsworth, Sault Ste. Marie, Ont., has bought out the interests of his partner, T. A. Corrigan, of the Corrigan Lumber & Mill Co., Sault Ste. Marie, Ont. His firm had worked-up a successful business in the planning mill and sash and door line.

The Victorian Case Co., Limited, Toronto, was recently incorporated to manufacture and deal in furniture and to handle merchandise of all kinds; capital $40,000. N. Phillips and M. B. McPherson, barristers, Toronto, are two of the incorporators.

The British Chair, Seat & Panel Engraving Co., is considering establishing a plant at North Bay. This change is being contemplated owing to the high price of hardwoods in England and to the fact that they would like to be near the source of supply.

The planing mill operated at Newmarket, Ont., by W. H. Eves was recently damaged to the extent of $3,000. by fire. The blaze started in the machine shop and was not discovered until it had gained considerable headway. Much of the damage incurred was caused by water.

The plant of the Chestnut Canoe Company, Limited, Fredericton, N. B., was completely detroyed by fire recently. The loss includes all the equipment, models and material together with 300 completed canoes, and runs about $75,000. The insurance carried was only $20,000.

The Canadian Billiard Table & Supply Co., Ltd., Toronto, have been incorporated to manufacture and deal in billiard tables, bowling alleys, refrigerators, phonographs and store and office fixtures; capital $25,000. J. S. Lovell and C. D. Magee, of Toronto, are among the incorporators.

The Mayfair Company, Limited, Toronto, was recently granted a provincial charter to manufacture and deal in phonographs, pianos, organs and other musical instruments. Capital $40,000. Two of the incorporators are W. A. Henderson, and W. N. Irwin, barristers, both of Toronto.

Thomas B. Dowsley, one of the oldest residents of Owen Sound, Ont., died at his home recently at the age of 87 years. The deceased was a well-known carriage manufacturer starting in 1854. He invented the Dowsley carriage spring, and for fourteen years was president of the Dowsley Spring Axle Company, of Chatham, Ont.

Rice Lake Canoe Co., Limited, Cobourg, Ont., which is associated with Langslow, Ltd., have about completed a new addition to their plant. Among the equipment to be installed is the following C . M. C. machines: Revolving bed sander, 26" double surfacer, swing saw, variety saw, belt sander, chain saw mortiser and straight edging and jointing saw.

The Parker Motor Car Company, Limited, Montreal, was recently organized. Sir William Price and Sir Alexander Bertram and certain Canadian financial interests have put up $500,000, to start the company. It is expected that a Canadian car will be put on the market which will be the equal of any of the medium-priced cars of United States manufacture.

The North American Furniture Co., Limited, Owen Sound, Ont., are issuing an attractive house organ in the shape of an eight-page booklet called "The Furniture Future." This pamphlet contains a number of sales ideas and suggestions which should be of real benefit to retail furniture dealers as well as illustrating and describing some of the North American line.

The Cost Accounting Department of the Furniture Manufacturers' Association, Woodstock, Ont., which has been in charge of James E. Ferguson, has been moved to Toronto, and will henceforth be located in the same suite of offices as the Association itself. Mr. Ferguson, who will continue to direct the affairs of this company, will make his headquarters in Toronto.

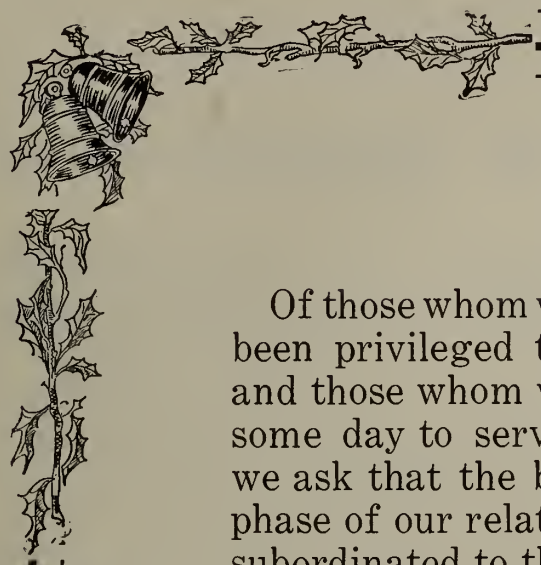
A. R. Duff, an engineer associated with the Research Department of the University of Toronto, is now available to visit furniture factories in connection with dry kilning or other troubles which come within the scope of the trained engineer. Mr. Duff has called on several furniture men and has assisted them in overcoming certain difficulties with which they were contending.

The Toronto Housing Co., Limited, Toronto, Ont., have decided to inaugurate an extensive building campaign. Starting early in the spring they propose erecting as large a number of apartment houses as they can handle. They figure that while building costs are high, yet they are about as low as they will go for some time and that owing to the shortage of homes, the erection of apartment houses is particularly profitable at the present time.

Frank Stanley, piano manufacturer, Toronto, has purchased the entire assets of the Cecilian Piano Co., Toronto, including factory on Niagara St. This is one of the largest deals which has taken place in the piano industry in recent years, as the assets of the Cecilian Company represent some $200,000. It also seems to indicate that the future of the piano industry is viewed in a very favorable light by those in closest touch with the musical instrument field.

The Regina Sash & Door Factory, Regina, Sask., have been refused permission by the city council to erect a new plant on a site owned by the company at Athol & South Railway Sts. This was in deference to protests from ratepayers who claimed that the presence of a factory in this district would lower property values. A new site is under contemplation and if negotiations are successful, the new plant of the Regina Sash & Door Factory may be located in Block 318 immediately south of the C. P. R. tracks.

The Jones Products Co., Limited, have been granted a provincial charter to operate a box factory, manufacture toys, sash, frames, doors, columns and all such things used in the building trads. Other powers conferred upon the company are to manufac-



Of those whom we have been privileged to serve and those whom we hope some day to serve, may we ask that the business phase of our relations be subordinated to the sentiment of the season. Our cordial good wishes are of a sincerity augmented by their very repetition these many years — A Merry Christmas and A Happy New Year to you.

Anderson Tully Co.
Memphis

ATCo MEMPHIS SOUTHERN HARDWOOD LUMBER & VENEER

ture furniture and household necessities and to operate sawmills, planing mills, etc. The capital stock is $40,000. and the head office is in Toronto. Among the incorporators are Thos. H. Hancock, Ernest R. French, Benjamin R. Jones, James E. Booth and M. R. Virtue, all of Toronto.

The Society of Graphic Arts, recently held a meeting at which the subject of commercial design, particularly furniture design, was discussed. A. H. Robson, the president, stated that he had been in touch with several of the larger furniture manufacturers and was informed that they were forced to go to Grand Rapids for their designs and that the furniture industry would welcome the development of a school of Canadian designers who would bring out what might be termed "Canadian designs." It was the consensus of opinion that this phase of applied art should receive greater attention.

Shurly-Dietrich Co., Limited, Galt, Ont., staged a saw tooth guessing contest at the Made-in-Galt Exposition, held recently in that city. They showed a coil of ½-inch band saw blade and offered a number of prizes for those who came nearest guessing the exact number of teeth. The correct figure was 22,012, The prize-winning guess was 22,016, the second prize was won by 22,001, and the third 22,000. This contest aroused a considerable amount of interest and was the means of getting $75.00 for the Galt Hospital. The guesses submitted ranged all the way from 456 to 45,000,000.

Fire broke out recently in the lumber yards of Reid & Co. at the foot of Berkeley St., Toronto, and did damage to the extent of $20,000. A two-storey galvanized iron building, containing the planing mill equipment and a quantity of lumber was wiped out as well as the dressed lumber shed immediately to the south in which a considerable stock was stored. The flames also spread to the lumber piles adjoining and did damage to about 100,000 feet. To the north of this the major portion of the lumber of the firm was piled and fortunately the wind was blowing to the south. The head of the firm J. B. Reid, left last month for St. Petersburg, Florida, where he is spending the winter. For the past two years the business has been managed by his son,Capt. G. T. Reid. It is thought that the blaze broke out either through strangers smoking or by an electric wire proving defective.

"The Band Saw" is the name of a small book issued recently for filers, sawyers and woodworkers, by the Simonds Canada Saw Co., Limited, Montreal, which is affiliated with the Simonds Mfg. Co., of Fitchburg, Mass. This book gives the brief outline of how band saws are produced, and contains practical information covering such important operations as rolling and tensioning, levelling, brazing, fitting and running small band saws, band saw speeds and strains; how to tension a band saw, and other information of a similar nature. In compiling this book, the Simonds Company have endeavored to set forth in a clear, concise manner practical suggestions and information based on the best practice as found in woodworking plants, with the idea of assisting all who have to do with the upkeep of band saw blades. They have undoubtedly succeeded in their effort, and a copy of this book should be in the hands of all band saw users.

Robert McLaughlin, founder of the McLaughlin Motor Car Co., and the McLaughlin Carriage Co., passed away recently at his home in Oshawa, Ont. He was in his 85 year and was one of the best-known manufacturers in Canada. Early in life Mr. McLaughlin took up the calling of a farmer, but his heart was not in this work. In 1869 he built a carriage shop at Enniskillen. In 1879 his business had grown to such an extent that he found it necessary to move to a railroad centre and selected Oshawa as the home of his new industry. From that on his business grew and developed. In 1889 he adopted a wholesale policy and in 1893 his two sons, George and R. S. McLaughlin, were taken into the business. 1907 witnessed the founding of the McLaughlin Motor Car Co. Later on the carriage plant was sold to Carriage Factories, Limited, while a second organization, known as "The Chevrolet Motor Co. of Canada Limited," was formed. Mr. McLaughlin did not confine his attentions entirely to business and industrial matters but took a great interest in Canadian and international affairs.

Book on Wood Turning

"Art and Education in Wood Turning," is the name of a text book recently published by the Manual Arts Press, Peoria, Ill. The author Wm. W. Klenke, is not only an expert turner but has a keen appreciation of that which is beautiful and as a consequence we find that his book deals with turning from both the practical viewpoint and with an eye to beauty in line and form.

This book offers complete detailed information regarding the use of wood-turning tools, their care and how they are kept in cutting order. The use of each tool is illustrated and described; for example, one section heading is "The skew used for smoothing cylinders," another "The skew chisel for V's and beads." Another interesting feature is the illustrations which outline designs for floor lamps, smoking stands, lamp standards, candlesticks, croquet mallets and various problems in wood turning. The price of this book is $1.40.

Study Merchandising Methods

At a recent meeting of the Furniture Manufacturers' Association, a committee was appointed to consider the question of the better merchandising of furniture. The plan is to make a detailed study of the merchandising methods of other leading industries with a view to bettering the methods in vogue in the furniture field. It is believd that much good can be accomplished along this line.

To Urge Standard Designs

The standardization conference, called by the National Lumber Manufacturers' Association met recently in Chicago to urge the adoption of standard sizes and standard designs for yard stocks and stock mouldings. The designs and sizes as recommended at an earlier meeting of the standardization committee were published in the "Canadian Woodworker and Furniture Manufacturer" some months ago.

When buying a band saw remember that the smaller the wheels which move the saw the greater is the bend on the saw. The more it is bent the sooner it is worn out.

When the teeth are all gummed up, put a little paraffin on them—then you can brush off the gum.

Your Protection—
Our Guarantee

THE KRAETZER-CURED LUMBER CO.

Stamped on
Every Piece

The Economy of the Obvious

When you buy gum that is stained you are buying in the dark.

This graded, but stained gum arrives at your factory and is worked up into your own particular product.

Then comes the reckoning

From your plant superintendent comes the report that of the last delivery of gum such and such an amount had to be discarded because of dote, some more because of check, and more, perhaps because of wormholes.

All this because neither you nor the grader could see the defects—defects covered by the stain.

The Obvious Gum

When you buy KRAETZER-CURED GUM you know what you are getting. Each piece is bright and clean, and free from stain.

All stained gum is dotty or rotten in the interior of the piece—much of it so badly as to entirely unfit it for use.

Can your scratch-pad figures prove any real economy in buying stained and incorrectly graded gum when clean and correctly graded KRAETZER-CURED GUM can be purchased at a great eventual economy?

Write or wire to us for quotations.

The Kraetzer-Cured Lumber Co.

GENERAL OFFICE: GREENWOOD, MISS.

Band Mills: Greenwood, Miss., Moorhead, Miss.

Our Quartered and Plain Red and White Oak, Ask, Hickory, Red Gum and Tupelo is as fine as thc highest quality of virgin timber and thorough knowledge of production can produce.

THERE IS NONE BETTER

Information and Inquiries

You are cordially invited to make use of this department

Duty on Veneers

Dec. 2nd, 1921, Indianapolis, Ind.

Editor, "Canadian Woodworker,"

Could you give us any information as to what the duty is on mahogany veneer and lumber entering Canada, and if there is any import duty upon logs, rough or partially manufactured; also if there is a band sawmill in Toronto or if not, the nearest point at which one is located.

Sincerely yours,
Lumbermen's Finance Corporation.

The duty on veneers up to 3/32 inch in thickness in such woods as mahogany, rosewood and Spanish cedar, is 7½ per cent. In all other woods up to 3/32 inch, the duty is 15 per cent. Over 3/32 inch, it is considered as lumber and enters Canada duty free. Logs, lumber and partially manufactured stock, i. e., lumber dressed one side and one edge, enters Canada duty free, while any material manufactured further than this state carries a duty of 25 per cent. These duties are based on Canadian funds, plus an import tax of 3 per cent.

There is not a band mill in Toronto, the nearest being probably at Midland, Penetang or Sarnia. Some of the larger planing mills in Toronto, operating 7 and 8-inch band resaws, might be able to handle the cutting you have in mind.

Stock for Inlays

Nov. 22nd, 1921, Winnipeg, Man.

Editor, "Canadian Woodworker."

Can you tell me where I can secure inlays and stringing 3/16 wide, white with black centre? Any information you can give me, will be appreciated.

Sincerely yours,
Peter Murphy.

You can secure inlays and marquetries of various kinds from T. Bernard & Co., 422 East 53rd St., New York. They carry a very complete stock and should be able to supply your requirements at short notice. It is not very difficult to make a plain white and black inlay, such as you describe, and by gluing up three thin pieces of wood, two outisde ones white and centre one black, in panel form, and then cutting strips from the edge, you have the inlay you desire. If you find it difficult to secure a black wood, you can take one of the softer white woods and color it with some suitable black dye. However, if you need some fancier inlays or stringing, it would pay you to purchase your requirements.

Special Automatic Lathe

Camrose. Alta., Nov. 26th, 1921.

Editor, "Canadian Woodworker,"

We would like to secure an automatic machine to manufacture a small toy. The article consists of two pieces, the largest of which is 6 inches long and ¾ inch in diameter, the other piece 2 inches long and 1 inch in diameter. Both pieces require to be turned ed and bored. If you can help us in this matter, we will appreciate your co-operation.

Sincerely yours,
E. Haines.

The automatic equipment used for turning bales or handles for bales should about suit your requirements. This machine turns and bores from each end at one operation. Would suggest that you get in touch with either one of the following firms:—Lewis T. Kline, Alpena, Mich. or A. D. Waymoth & Co., Fitchburg, Mass.

Wheels for Tea Wagons

Davidson, Sask., Nov. 5th, 1921.

Editor, "Canadian Woodworker,"

Can you tell me where I can secure rubber-tired wheels and castors for tea waggons, also cane bottoms for chairs.

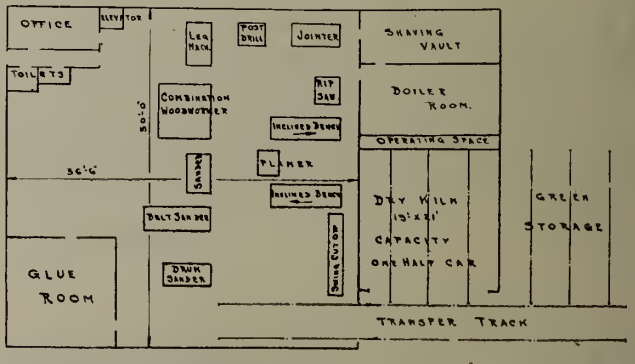
Thanking you in anticipation, I am,
Yours truly,
W. H. Blair.

We believe that you can secure the rubber-tired wheels and castors from the Faultless Castor Co., Evansville, Ind. The cane seats may be had from the Overseas Reed & Cane Co., Ionia, Mich.

Layout of Furniture Factory

Replying to the enquiry which was submitted by H. L. N. which was published on page 114 of the November "Canadian Woodworker," I offer the following suggestion:—

In properly laying out a small furniture factory there are many phases of local importance to be taken into consideration, which can only be determined by the owner. However, there are a few standard rules



which should be instituted if possible. In the above drawing the writer has endeavored to incorporate a few details which will lessen the up-keep, cost of production as well as reduce the initial cost of the building.

You will note I have suggested a change in the location of the boiler room. The object in doing this is two-fold,—first we can make the outside wall serve as the end wall of the dry kiln cutting down the cost of an extra wall; secondly, usually in a small factory of this size, the engineer also operates the dry kiln, so by placing the dry kiln operating room in the boiler room we have placed the valves, traps, damper controls, recording instruments, etc., in a spot where the engineer can give them his best attention. This ar-

C. A. Spencer, Limited

:: Members National Hardwood Lumber Association ::

Merchants
and
Manufacturers
of

CANADIAN HARDWOODS

Good Stocks Right Grades
Prompt Shipments

Crating of all descriptions

McGILL BUILDING - MONTREAL

Hardwoods

Some items on hand in our Toronto Yards for Immediate shipment

4/4" To 16/4"

Ash	9870 ft.	Hickory	500 ft.
Basswood	49854 "	Maple, Birds-eye	1288 "
Beech	49085 "	Maple	36213 "
Birch	56697 "	Mahogany	12578 "
Chestnut	70813 "	Oak, Plain	62099 "
Cypress	29200 "	Oak, Qtd.	24445 "
Cherry	500 "	Poplar	46408 "
Elm	42657 "	Walnut	2753 "
Gum, Red	38089 "	Walnut, Circassian	3646 "
Gum, Sap	14494 "		

We can Kiln Dry your Transit Cars

Our Dry Kilns are operating night and day to full capacity, of about 250,000 ft. per month.

The Gall Lumber Co. Ltd.

ESTABLISHED 1875

Foot of Spadina Ave. TORONTO

"Hardwoods are moving and good stock getting scarce. We still have some desirable items of

Ash
Basswood
Birch
Elm

Will be glad to quote on request"

Canadian General Lumber Company, Limited

712 Bank of Hamilton Bldg.
TORONTO

MONTREAL OFFICE: 203 McGill Bldg.

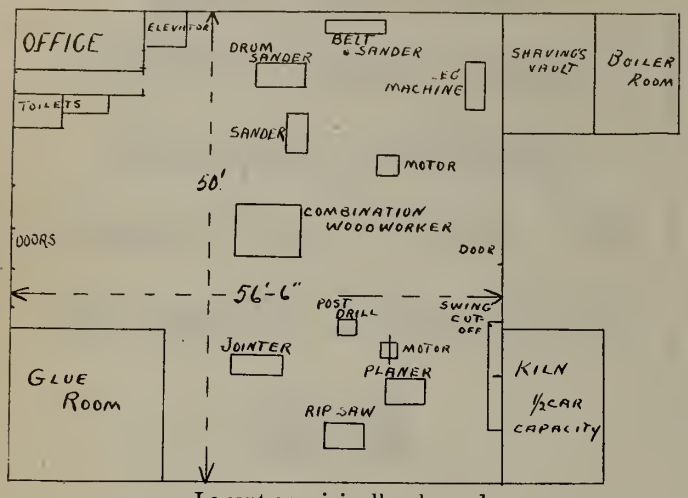
Selling

Graves, Bigwood & Co.'s

Lumber, Lath and Box Shooks

rangement also places the kiln feed and drain lines to the nearest point to the boiler.

The kiln itself is a cross piling dry kiln holding three 6 ft. trucks, each with a capacity of approximately 3 M feet, or a total kiln capacity of nine to ten thousand feet. In conjunction with the dry kiln, I suggest a green storage track which will accomo-



Layout as originally planned

date the same number of kiln trucks. With such a system this green storage track can be kept loaded at all times so that when the kiln is unloaded no time will be lost in refilling. A dry storage shed also should be included as lumber should be allowed to cool off and even up before going from kiln to the machines.

In placing the machines I have tried to arrange them so as to keep the lumber progressing through the numerous processes without back tracking. Just which machine follows the preceding operation altogether is determined by the requirements of this particular factory, as it is very seldom that two factories can have the same arrangement of machinery and both work out with equal success. So in this drawing I have not set up these machines in perhaps just the alignment which may be required but the general principle works in all cases.

In a small factory of this size the machines could be operated from one drive shaft down through the center. However, I have left room that two shafts could be installed if there is any particular reason for so doing. The arrangements of work benches can be so planned as to aid in the reduction of loss labor in handling the stock. All door openings will be contingent upon local environments.—C. A. Fields, Toronto.

Furniture Factory Layout

It is rather difficult to size up a layout for a furniture factory without knowing the lines to be manufactured and the output contemplated. I do not think much of a combination machine as a piece of production equipment in a plant of this kind. It is ideal for a contractor to set up on a job and do odd bits of machine work, and it is also very handy for a small woodworker who has not sufficient work to warrant the installation of individual machines, but where the volume of work going through is large, the combination machine is not suitable. In its place you might find it a good investment to instal a variety saw, single spindle shaper and band saw.

Another suggestion would be with regard to dry kiln facilities. Taking into consideration the fact that your business is likely to grow, would it not be wise to provide adequate dry kiln facilities to take care of any reasonable increase in your drying requirements. With a kiln holding a half car of lumber you can hardly figure on drying two lots a month which would mean that your production may be held down because of the fact that you would not be able to dry lumber in excess of 15000 or 16000 feet a month. It might be a good suggestion to instal a two-compartment kiln, each compartment having a capacity of half a car. If, at the present time, you do not need more than one car of dry material per month, you can use the other compartment as a dry storage and cooling room. This is a very necessary adjunct.—H. A. H.

Furniture Prices Investigated

Dr. Hastings, thte medical health officer for Toronto, recently completed an investigation into the prices of furniture. This was in connection with the reports he is making on the high cost of living. Dr. Hastings found that furniture prices had dropped on an average of 30 per cent from the peak, the reductions varying according to the nature of the article and the workmanship and design of the piece.

In some cases, especially with regard to the highest grades of furniture, where labor is one of the largest items involved, the reductions ran from 5 to 10 per cent. On the other hand, he found that certain close-outs or distress lines were being sacrificed at a reduction of 50 per cent. He gathered figures from both the manufacturing and retail branches of the industry, and it appears as if the furniture manufacturers have put into effect a greater reduction than have the retail dealers. From the figures gathered in the retail field, the average reduction varied from 23.3 to 17.7 per cent, while in the manufacturing end the reduction averages close on 30 per cent.

It was brought out that furniture costs at the present time are considerably higher than they were in 1914, labor being 90 per cent higher, lumber 82 per cent, plate glass 50 per cent and tapestries 65 per cent higher than in 1914. These figures represent a reduction from the peak prices of 1920 as follows:—wages 15 per cent lower, lumber 35 per cent lower, plate glass 30 per cent lower.

Dr. Hastings reports that it is not likely that furniture prices will go much lower, in fact from what he could gather, it is more than probable that there will be a stiffening of values in certain lines. This is just in line with the general impression held by all who are in close touch with this industry.

Publicity Bureau Changes Name

The Furniture Publicity Bureau, which was organized to handle the advertising campaign of the American furniture manufacturers, has changed its name to the "American Homes Bureau." This was done primarily to permit of a more universal appeal and also to remove any doubt which might arise as to the motive underlying this movement. It is thought that the new name will remove any taint of commercialism which might happen to be raised were the name "Publicity Bureau" retained.

Greetings of the Season
with
Our Best Wishes
to all for a
PROSPEROUS 1922

PERKINS GLUE COMPANY

Factory and General Offices:
Lansdale, Pennsylvania

Sales Offices:
South Bend, Indiana.

Quick Action Vise

Modern equipment is essential to progressive manufacturing. One of the items that has undergone considerable improvement and development during recent years is the humble bench vise. The old type, with either wood or steel screw, which had to be tediously turned in or out, has been replaced by the modern style of quick-acting vise. With this latter design, a half-turn of the screw either releases or locks the nut on the screw. In this way the jaws of the vise can be opened or closed with extreme rapidity. The accompanying illustration shows, in detail, a type of quick-acting vise which has been placed on the market by the Globe Vise & Truck Co. of Grand Rapids, Mich. It will be noticed that there are no delicate castings to give trouble, every part being built to stand a considerable amount of wear. The screw is made of 1 ⅛ in. carbon steel with threads cut away longitudinally, permitting a free movement of the screw backward and forward, giving a quick reliable action with a sure grip when pressure is required.

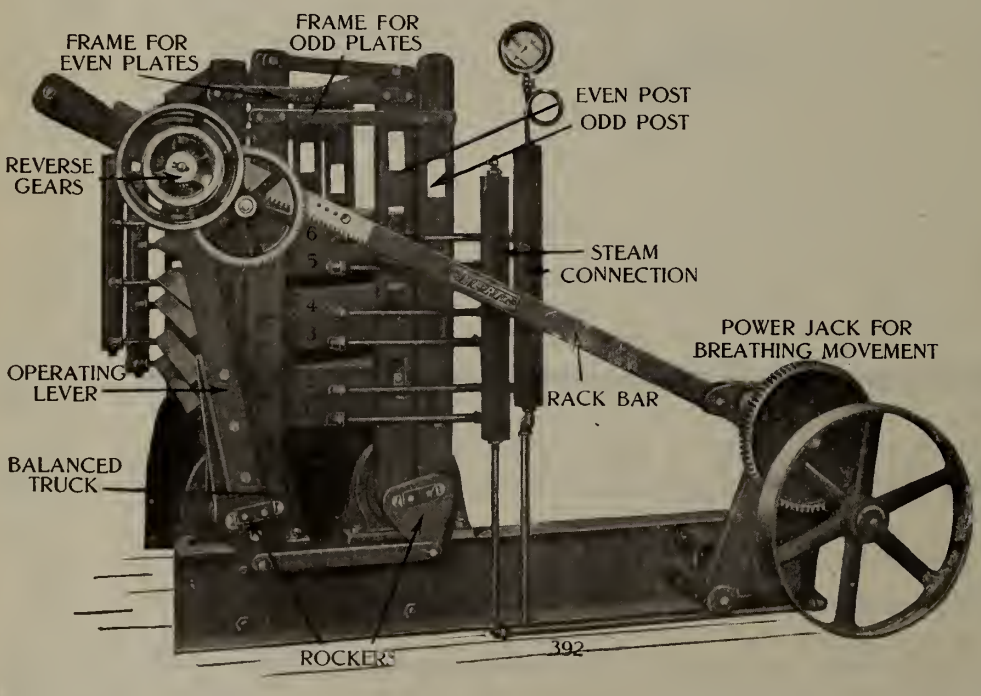
Cutting off the advertising may reduce your expenses, but so does cutting your windpipe reduce the cost of living.

Closer Attention To Fine Circular Saws

It is a well demonstrated fact that every mill or factory, whether devoted to the manufacture of lumber, shingles, staves, heading, veneers, etc., or to the production of boxes, furniture, sash, doors, and blinds, or to general planing, turning and wood finishing connected with any line of manufacture—will find the use of finely fitted saws a prime necessity to successful work, says a writer in "Hardwood Record." Factory saw fitting deals with a different kind of work, and laso a different class of saws from sawmill work, in that there are in use small bands, band resaws, circulars for ripping, resawing and cross cutting, which are expected to cut smooth and clean on a very small kerf to a line, and stand good feed, also scroll saws and the great variety of knives, cutters and bits that are found in the equipment of every extensive plant.

In the fitting of factory saws there are the same essentials to first class work as in the sawmill; namely, the right hooks and pitch of teeth, the right throat room, the right tension, the right fitting of the cutting points, the absolute roundness of the saws, the proper feed of the timber to just meet, but not exceed the capacity of the saw and the construction of the sawing machine itself. The most exact and up-to-date fitting will fail to accomplish satisfactory results on poor machines, neither will the very best machines give good results on poorly fitted saws. I am not going into details on how to fit the tension band resaws and round saws, but I will, however, give my opinion on a small scale on round saws in connection with the rest of my article.

Be enthusiastic! In every battle of life—be it business or football, service or sport—the man with enthusiasm always wins the support of the crowds. No matter what you are attempting to do, be the cause worthy, the element necessary to bring success, is enthusiasm.



VENEER MERIT MACHINERY

MERRITT ENGINEERING AND SALES COMPANY LOCKPORT N.Y.

MESCO

The "Merit"

Re-Drier

FOR VENEER

INSURE your veneer work against surface checks, hair lines, blisters, warping and glue failure by installing a "Merit" Re-drier..

Thoroughly dry and flat veneer avoids these troubles, gives tight joints and saves glue.

No system of air drying will accomplish this result. Hot Plates with "breathing movement" are the thing.

MERIT

HYDRAULIC VENEER PRESSES
AND
LUMBER ELEVATORS

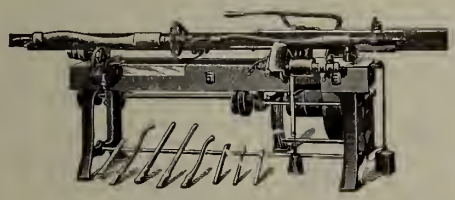
Write for Explanation of our Most Efficient Veneer Package Handling System

E. B. VAN ATTA & CO., INC.
OLEAN, N. Y.

New York City Office: 50 Church St. Chicago Representative: Fader Machinery Company, 549 Washington Boulevard

Klotz Machine Co's
Handle Machinery

Used Wherever Handles Are Made



42-Inch Handle Lathe

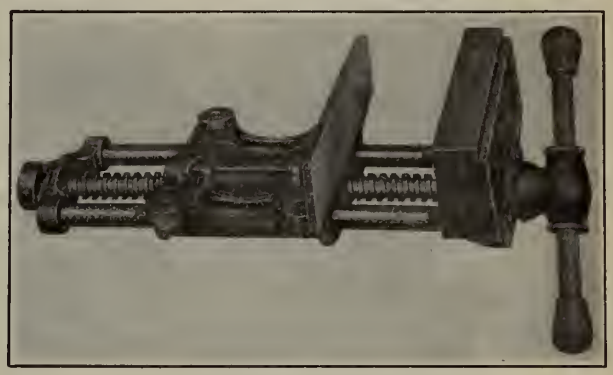
Lathes for turning Ax, Adz, Hammer, Hatchet, Pick, Sledge Handles, etc., and for turning other irregular articles. Bolting, Blocking, Shaping and Cut-off Saw Machines, Handle Knobbers, End Shapers, Polishers and Throaters.

We also make Wine Maker's Machinery, Shafting, Pulleys, Hangers, etc.

MANUFACTURED BY
Klotz Machine Co., Sandusky, O., U. S. A.

Write for descriptive circulars and prices.

The Vise You Swear BY not AT



On the Market for 15 years.

Globe Vise & Truck Co.
GRAND RAPIDS, MICH.

We also manufacture a complete line of steel trucks particularly for wood working factories. The body of our truck is absolutely indestructible, and there are no nails nor screws in the top to mar material, whether finished or unfinished. The roller bearing feature in the wheels allows for much easier handling than the old style plain wheels on the wood truck. In fact one man can handle much more material than on the old style. The price is very little more than that of the old style wood trucks.

BLACK BROS.
CLAMPS

Where Black Bros. Clamps are known, there is no second choice. Know them.

Sold by Aikenhead Hardware Ltd., Toronto Vokes Hardware Co., Ltd. Toronto J. L. Neilson & Co., Winnipeg and other leading dealers throughout Canada.

The Black Bros. Co. - Mendota, Ill., U.S.A.

The Door Carrier System

Makes your dry-kiln doors steam-tight and saves time, heat, trouble and money.

Carrier lifts door clear of kiln and carries it down track. Returning, deposits door to rabbeted joint, where it is held steam-tight by its own weight. Applicable to old or new kilns.

Ask for catalogue.

DRY KILN DOOR CARRIER CO.
1117 Cornell Ave.
INDIANAPOLIS, IND.

General Woodworking Trade Mart

Quick Action Section

Equipment Materials Employment

GOOD VALUES

Subject to Prior Sale

These are only a few of our stock

Band Resaw, Connell & Dengler, 54 and 60″.
Band Rip Saw, Fay & Egan No. 202 chain feed.
Belt Sander, Curtis No. 20.
Circular Saw Mill, Hoosier Pony.
Circular Resaw, 44 in. heavy type.
Dowel Machines, Hayes & Fay.
Dowell Gluer and Driver, E. B. Hayes.
Door Clamp, Hayes Standard Power.
Jointer, Falls Machine Co., undercut 24 in.,
Jointers, 18″ and 24″.
Lathe, Back Knife Clement 40 in.
Moulder, Hermance 8 and 10 in., 4 side.
Moulder, Woods 10 and 12 in. inside.
Moulder, American 10 in., 4 side.
Matcher, American No. 229 fast feed hardwood flooring.
Planer, 30 in. Fay &Egan Single Cabinet.
Buzz Planer, 16 and 24 in.
Sander, endless bed 48 in., H. B. Smith.
Sander, Moore Machine Co., belt.

Woodworking Machinery Company of Buffalo,
54 Mechanic St.,
Buffalo, N.Y.

FOR SALE

Bargains

Planer and Matcher 24″ Double Surfacer
Moulder, 12″, Ballantine, fine condition
Buzz Planer, 16″, safety cylinder.
Box Board Matcher, Mereen-Johnston, new.
Surface Planer, 24″ good as new.
Continuous Feed Glue Jointer, C.M.C.
Shaper, 2 spindle.
Tenoner, double copes.
Band Saws, 26″, 30″, and 34″ wheels.
Variety Saw, with mortising attachment.
Swing Saw.
Fox Trimmer.
Sander, Two Drum 36″, Jackson-Cochrane.

Cowan & Company of Galt Limited, Galt, Ontario. 12

Hardwood Salesman Wanted

to represent in Canada a high-class firm on a salary and expenses basis. Must be well acquainted with lumber buyers and be a producer. Apply in confidence to Box 120, Canadian Woodworker, Toronto. 12

FOR SALE

One large size Billstrom Clamping Machine
One Mattison Turning Machine with equipment
One Moore 6′ Power Stroke Panel Sander
One Houston 8 x 4-4 sided moulder, complete
One Belt Power Driven Veneer Press 36 x 54″
One Fay Egan Chain Feed Rip Saw (Lightning)

These Machines are all guaranteed in first class condition. References—American National Bank, Jamestown, N. Y.

Mattison Machine Works and Nels J. Billstrom at Rockford, Ill. 12

WANTED

First class foreman finisher. One thoroughly competent to produce the best finishes, including all special finishes. State experience and wages required. Apply Box 119—The Canadian Woodworker, Toronto. 12-1

WANTED

2 No. 11 Morgan Nailing Machines, closed back, double row of chucks, side arm and clinching attachment. Apply Salada Tea Company of Canada Limited, 461 King St. West, Toronto. 12

Chicago City Drawbridges

Fifty movable highway bridges are maintained by the city of Chicago, the different types being as follows: 24 trunnion bascule bridges, 12 centre bearing swing bridges, 12 rolling lift bascule bridges, one vertical lift bridge and one pontoon bridge. Of the trunnion bascule bridges, 22 are of the type developed by the city and the others are of the Strauss and Page & Schnable types. The pontoon bridge is across the Calumet River at Torrence Ave.

35 Per Cent. Gain in Asphaltic Pavement Yardage

Reports from U. S. city engineers to the Asphalt Association, New York, show that over 30,000,000 square yards, or 1,750 miles of asphaltic pavement, 30 ft. wide, will be laid on city streets this year. Reports from state highway departments indicate that 23,000,000 sq. yd. will be laid on the state highways, while the area laid in counties and other districts will bring the total to 65,000,000 sq. yd., or 3,690 miles of asphalt pavements 30 ft. wide. This will be an increase of 35 per cent. over the yardage in 1920.

New Bridge for Sydney, Australia

Specifications to cover the design, construction, and erection of the Sydney (Australia) Harbor North Shore Bridge are expected shortly by the U. S. Bureau of Foreign and Domestic Commerce from Trade Commissioner A. W. Ferrin, and upon their receipt copies will be placed on file in the Bureau's New York and Chicago offices, where they may be consulted by interested persons.

The bridge will consist of nickel-steel cantilevers supporting a central girder section, also constructed of nickel steel, spanning the harbor between Dawes Point and Milson's Point. Each anchor or shore arm will be 500 feet long, the harbor or cantilever arms will be 520 feet long, while the central section is to be 560 feet long, thus making a span of 1,600 ft. from centre to centre of the main supporting piers and a total length of steel work of 2,600 feet. Between the main girders, which are 94 feet 6 inches apart, provision is made for four lines of electric railway and a roadway 35 feet wide. Outside the main girders on the east side is a motor roadway 18 feet wide between the handrails, and on the western side a footway 15 feet wide, the railways, roadway and footway being all on the same grade. A headway of 170 feet above high water is provided for the central 600 feet of the bridge, with a clearance of not less than 156 feet over the whole fairway.

The Sydney Harbor bridge will thus have five feet greater span and 35 feet more headway under the centre than does Brooklyn Bridge, and will have a span only 200 feet shorter than that of the Quebec Bridge, but with a headway 20 feet greater. The estimated cost of the bridge is £6,000,000, and the work is expected to extend over eight and a half years.—Commerce Reports.

Harbor to be Deepened

The London & North-Western Railway Company have contracted with the Tilbury Contracting & Dredging Company, Limited, of Westminster, England, for the deepening of the harbor at Holyhead. This work, in addition to a large amount of ordinary dredging, comprises the removal of nearly 200,000 tons of rock, on which the most up-to-date type of rock-cutting plant will be used.

Decrease in Building Activities

There was a notable increase in building activities in Argentina during the first half of the year, the total construction for the first six months of 1921 amounting to 62,240,000 paper pesos, as compared with 30,900,000 paper pesos during the same period of 1920. The month of June, however, witnessed a decline in building operations and it is claimed that the recent rent legislation will have a further tendency to reduce the construction of new buildings.

DARNELL-LOVE LUMBER COMPANY

MANUFACTURERS AND EXPORTERS

HARDWOOD LUMBER

LELAND, MISS.
U.S.A.

F T. TURNER, President
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CABLE ADDRESS
"DARLOVE"

TWO BAND MILLS

CODES USED
UNIVERSAL
A.B.C 5th EDITION IMPROVED
WESTERN UNION

The following is a list of unsold lumber on our Yards, nearly all of which is dry and available for prompt shipment. We solicit your inquiries and orders.

QUARTERED WHITE OAK

Ft.	In.	
50,000	3/4	No. 1 C&S
15,000	4/4	No. 1 C&S. Strips 2½-5½ in.
60,000	3/4	No. 2 Com.

PLAIN WHITE OAK

50,000	5/8	No. 1 C&S
25,000	1/2	No. 2 Com.

PLAIN RED OAK

20,000	5/8	12&Wdr. Cof. Bds.
20,000	3/4	12&Wdr. Cof. Bds.
6,000	3/8	FAS
40,000	1/2	FAS
250,000	5/8	No. 2 Com.
300,000	5/8	No. 3 Com.
200,000	3/4	No. 3 Com.

ELM

18,000	12/4	No. 1 C&S
45,000	6/4	Log Run.
60,000	8/4	Log Run.
12,000	6/4	No. 2 Com.
15,000	10/4	No. 2 Com.
15,000	12/4	No. 2 Com.
75,000	5/8	No. 3 Com.
40,000	3/4	No. 3 Com.

CYPRESS

15,000	4/4	FAS
15,000	5/4	FAS
60,000	6/4	FAS
60,000	12/4	FAS
30,000	4/4	Sel.
30,000	6/4	Sel.
75,000	4/4	No. 1 Shop.
60,000	6/4	No. 1 Shop.
45,000	8/4	No. 1 Shop.
15,000	6/4	No. 1 Com.
15,000	8/4	No. 1 Com.
30,000	6/4	No. 2 Com.
30,000	4/4	Peck.
30,000	1x6	No. 1 Com.
60,000	1x6	No. 2 Com.
45,000	1x6	No. 1 Boxing.

COTTONWOOD

45,000	4/4	FAS 6-12 in.
45,000	4/4	No. 1 C&S

PLAIN RED GUM

30,000	3/8	No. 1 C&S
20,000	3/4	No. 1 C&S
30,000	4/4	No. 1 C&S

PLAIN SAP GUM

75,000	5/8	FAS 6-12 in.
20,000	3/4	FAS 6-12 in.
40,000	5/8	FAS 10-12 in.
40,000	5/8	FAS 13-17 in.
100,000	3/4	FAS 13-17 in.
30,000	4/4	FAS 18-21 in.
20,000	4/4	FAS 20 in. and up.
25,000	5/8	No. 1 C&S
150,000	3/4	No. 1 C&S
30,000	4/4	No. 1 C&S
20,000	5/8	No. 2 Com.
30,000	8/4	No. 2 Com.
20,000	5/8	No. 3 Com.

QUARTERED RED GUM

40,000	5/8	FAS
17,000	3/4	FAS
100,000	5/8	No. 1 C&S
200,000	3/4	No. 1 C&S
15,000	4/4	No. 1 C&S
30,000	5/4	No. 1 C&S
40,000	6/4	No. 1 C&S

QUARTERED RED GUM
(Sap No Defect)

60,000	5/8	FAS
60,000	3/4	FAS
50,000	4/4	FAS
40,000	6/4	FAS
75,000	8/4	FAS
75,000	5/8	No. 1 C&S
125,000	3/4	No. 1 C&S
50,000	4/4	No. 1 C&S
15,000	6/4	No. 1 C&S
15,000	8/4	No. 1 C&S

ASH

4,000	3/8	No. 1 C&S
3,000	5/4	No. 1 C&S
4,000	6/4	No. 1 C&S
12,000	12/4	No. 2 Com.
15,000	4/4	No. 3 Com.
7,000	12/4	No. 3 Com.

It is understood that our stocks are constantly changing by reason of manufacture and shipment. We are prepared to surface one or two sides.

Our Sales Representative in the Chicago and Michigan Territories is the

LELAND STAVE & LUMBER COMPANY

HOME OFFICE LELAND, MISSISSIPPI

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LELAND, MISS.
U.S.A.

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1039 MARQUETTE BUILDING
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C.W PARHAM, Manager

Made in Canada.

The Sidman Lumber Curing Process

—IN—

Remodeled or new Wood, Brick or Concrete Buildings.

Automatic Heating and Ventilating Systems for Varnish Rooms.

Three-ply and Du-o-fold Army Duck Curtains.

Automatic Suction Systems, for returning all condensation direct to the boiler.

Reducing and Back Pressure Valves, Oil and Grease Extractors.

Cantilever Steam Traps and other Steam Specialties.

Active and Non-down Draught Vent Heads for all purposes.

Cleanable Screen Window and Panel Ventilators.

Roller Bearing Channel Iron Car Bunks and Transfer Cars.

Thermostats, Recording Gauges, and the Sidman Special Hygrometers.

For Description and Prices, write

The Sidmans of Canada

Heating and Ventilating Engineers
and **Lumber Curing Specialists.**

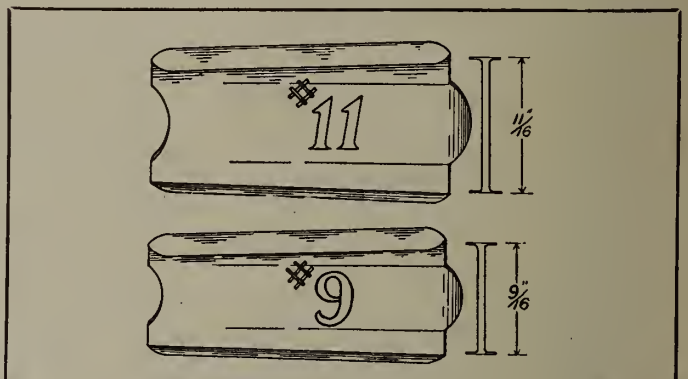
LONDON ONTARIO

Made in Canada.

Clamp Nails Reduce Costs.

"A joint made up with clamp nails may be placed in boiling water and dried in a kiln. It never lets go under any conditions." This statement may be verified by any of the numerous users. The use of clamp nails forms a present day method of construction that is unique, but which has been thoroughly tried, tested and generally adopted by the leading furniture and casket manufacturers as a necessity in the production of many desirable features of construction. In addition, it meets economical features as can be done in no other way. Clamping (the bugbear of all mitered work) is entirely eliminated. Clamp nails, as their name signifies, do their own clamping.

About eighteen years ago, J. T. Richards, who is now President of the Chicago Casket Company, Chicago, Ill., conceived the idea of assembling casket lid mouldings in frames and then drawing up the



Showing projection for easy starting and recess for setting

joints with clamp nails. Mr. Richards no doubt is the father of this idea, and it is estimated that since that time he has purchased forty odd tons of these nails for the different firms with which he has been connected.

The greatest economy is only practical when the work is properly done, by which is meant a study of this method of joinery and becoming familiar with these nails and their uses. Mitered joints are much to be desired in the construction of any work and when made up with these nails they are superior to those made with wooden splines, dove-tailing, dado jointing, mortising or doweling, and are more economical as they often show a saving of as high as 50% in assembling costs. The joinery of table rims, piano benches, frames, domed tops for phonograph cabinets, casket lids and bodies are only a few suggestions of what can be accomplished by this method.

The nails, as illustrated, are made in various lengths and widths to accommodate any type of construction and have recently been improved by a projection on the lead end for easy starting and driving and a recess in the driving end for setting the nail without any danger of marring the surface of the work. In using clamp nails a saw-kerf is made as in the use of the wooden spline, but in this case a 20 gauge saw is used and this sawcut just fits the shank of the nail.

The manufacturers of these nails, through a knowledge gained by many years of experience, are in position to assist in the working out of particular construction problems and it is their desire to co-operate with the users to this end. This practical and economical method is well worth looking into.

THE CHICAGO MIRROR
AND
ART GLASS COMPANY
Manufacturers
of
RELIABLE MIRRORS
AND
PLATE GLASS TOPS
Send your specifications
to us at
216 NO. CLINTON ST., CHICAGO, ILL.

Calhoun Plywood Company
Panels Tops Counter Fronts
OPERA CHAIRS
in the White or finished.
Vegetable or Waterproof
Glue.
Sheboygan - Wisconsin

IN TRANSIT YARD
TORONTO

Million Feet Bone Dry Hardwoods

Orders can be filled immediately

PHONE MAIN 210
705 Excelsior Life Building, Toronto
Anderson-Miller Lumber Co., Limited

In using *"Steelgrip"* CLAMP NAILS
only the ordinary machine work is required. Cut a slot, drive in a "Steelgrip," that's all. No clamping, no waiting for glue to set.
Avoid Substitutes
***"Steelgrip"* CLAMP NAILS**
Save Time + Labor = Money
Produce, Strength + Durability = Better Product
Shipped in cartoons of 1 lb. 5 lbs. and 10 lbs. each. Bulk packages 25 lbs., 50 lbs. and 100 lbs. each
CLAMP NAIL COMPANY
4532 PALMER STREET, CHICAGO
CIRCULARS and SAMPLES ON REQUEST.

Do not guess or estimate whether you have run enough th ough the moulder to fill the order. KNOW!

The Productimeter

This is a lumber meter that tells you all the time exactly how many feet have been run through on any job. Good big figures right in plain sight.

It is automatic—never tires—never forgets—never slips—never spins at the end of the board.

It saves its cost, over and over, in lumber, time, labor and power.

Try One 30 Days—Free.

DURANT MANUFACTURING COMPANY
615 Buffum St., Milwaukee, Wis.
(1662)

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Uniformity Guaranteed

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MACHINERY
AND
SUPPLIES

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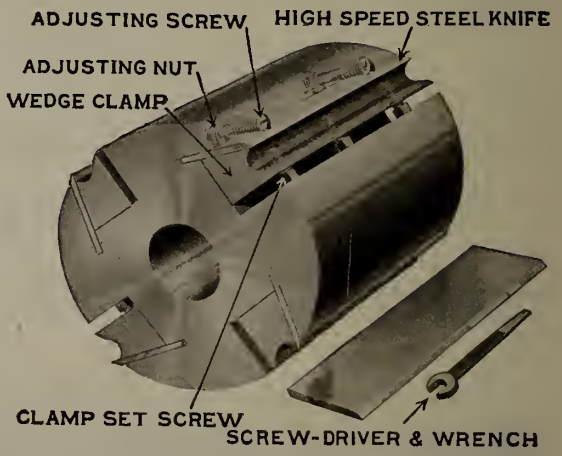

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There are over 3,000 of these Heads in daily use.
Write for circular and quotation.

C. O. Porter Machinery Co.
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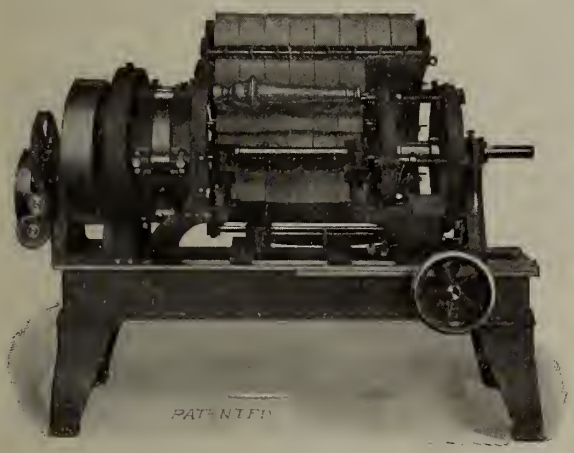

what it is costing you to sand your furniture and chair turnings by hand rather than on a Nash Sander?

If you don't it is high time you gave this matter serious thought.

Now is a good time to look into this.

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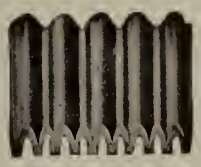
Cary's SUPERIOR QUALITY Corrugated Fasteners



SAW EDGE

PLAIN EDGE

According to final decision, after long litigation, we have been granted the SOLE RIGHT to manufacture a Saw Tooth Corrugated Fastener with a continuous cutting edge. Our fastener is beveled evenly on both sides, which enables fasteners to be driven in straight, and much easier than any other fastener made. Our Corrugated Fastener is made in various widths and corrugations, also in coils wound right and left. Try our products and you will use no other.

Samples and prices on request.

CARY MFG. CO., Brooklyn, N.Y.

The Peter Hay Knife Co., Ltd.

Manufacture the Best

PLANER KNIVES and CUTTERS

OF ALL DESCRIPTIONS

The Peter Hay Knife Co., Limited

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PRESSES

For Veneer and Veneer Drying

Made in Canada

William R. Perrin

Limited

Toronto

"Pony" Cabinet Clamp

For lightness combined with strength this clamp has no equal. All parts are selected from the best materials obtainable and we have spared no effort to make the "Pony" the finest thing of its kind on the market. Made in sizes to open 18 in. to 72 in.

"Jorgensen"

Peerless Adjustable Hand Clamp

Fits every grip without a slip and takes a tighter hold with less effort. It is a tool of real economy and a clamp that insures efficiency.

Adjustable Clamp Company

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For Sale By

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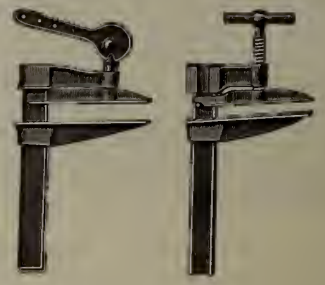
Colt's Clamps

for the

Woodworker



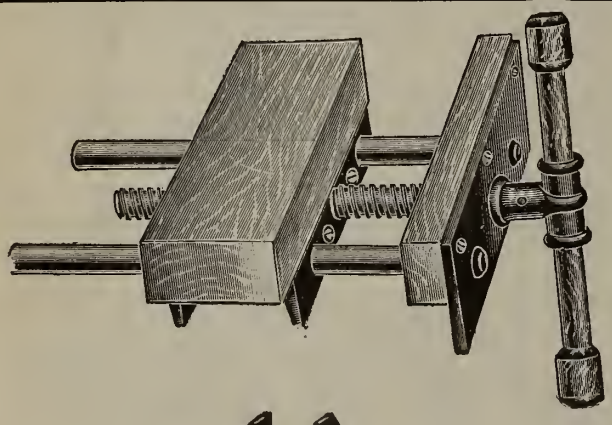
Colt's Universal and Vise Clamps are unsurpassed for the Furniture Manufacturer and General Woodworker. They are made right, both in design and quality of materials and workmanship.

Colt's Clamps are quick-acting and have broad jaw clamping surface.

For further information write for Catalogue No. 294.

Batavia Clamp Co.

235 Centre St. **BATAVIA, N. Y.**



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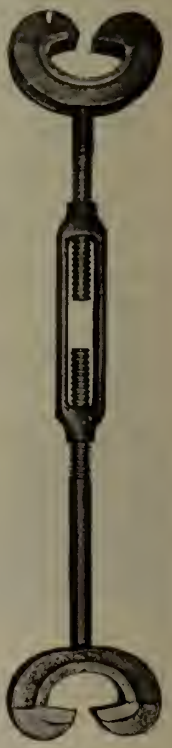
Better work follows the use of the "Empire"

There is no question about it. EMPIRE all steel clamps do the work with less chance of failure than any other you can purchase. In scores of shops where they are in daily use results bear out the truth of this statement. If you will try them once you will be convinced.

Get in touch with us now. We can make prompt delivery from stock.

We specialize in all types of woodworking tools.



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If the Slide Does Not Work properly Your Whole Table is Condemned

Wabash Slides insure **Satisfied Customers**

SLIDE MAKING is a SPECIALTY BUSINESS

We can Furnish Better Slides for Less Cost

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Window Frame Machines

This is the work ☞

Let us tell you about the machine.

Testimonials from hundreds of satisfied users.

F. V. Phillips invented and built window frame machines for 40 years. "The Phillips Line" is the culmination of his efforts.

Your inquiries solicited.

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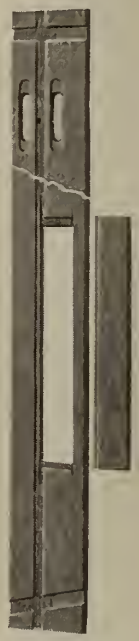

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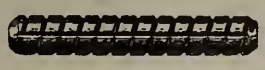

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Brand Garnet Products Make Good Sanders Better Sanders

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It is never forgotten all through the process of manufacture, from the selection and testing of the hard, sharp, pure, North River Garnet and the superior backings and glue, to the inspection of the finished products.

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MAKE GOOD SANDERS BETTER SANDERS

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Paasche Air Brush Co., Chicago, Ill.

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Earthman Lumber Co., Murfreesboro, Tenn.

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Garlock Machinery Ltd., Toronto, Ont.
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Garlock-Walker Machinery Co., Toronto, Ont.
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Yates Machine Co., P. B., Hamilton, Ont.

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Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
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Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.

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McKnight & Son Co., L. G., Gardner, Mass.

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Billstrom Nels J., Rockford, Ill.
Black Bros. Co., Mendola, Ill.
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Christiansen, C., Chicago.
Cowan & Company, Galt, Ont.
Empire Tool Co., Toronto, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Preston Woodworking Machinery Company, Preston, Ont.
Taylor Mfg. Co., Jas. L., Poughkeepsie, N.Y.

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Black Bros. Co., Mendota, Ill.
Taylor Mfg. Co., Poughkeepsie, N.Y.

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Clamp Nail Co., Chicago.

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Merritt Eng. & Sales Co., Lockport, N.Y.

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Lloyd, W. Y., Toronto, Ont.
Colborn, C. B., Memphis, Tenn.

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Mackenzie Machinery Co., D., Guelph, Ont.

CUT-OFF SAWS
Atkins & Co., E. C., Hamilton, Ont.
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Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

CUSHIONS
Cumfy Cushion Co., Toronto, Ont.

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Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Mattison Machine Works, Rockford, Ill.
Shimer Cutter Head Co., Galt, Ont.
Yates Machine Co., P. B. Hamilton, Ont.

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Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.

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Dry Kiln Door Carrier Co., Indianapolis, Ind.

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Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

DOWEL MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Ober Mfg. Co., Chagrin Falls, Ohio.
Williams Machinery Co., A. R., Toronto, Ont.

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Rowe Mfg. Co., Newaygo, Mich.

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Sidmans, London, Ont.
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DUST SEPARATORS
Canadian Blower & Forge Co., Kitchener, Ont.

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Radcliff Saw Mfg. Co., Toronto, Ont.

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Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
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Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
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Yates Machine Co., P. B., Hamilton, Ont.

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Garlock Machinery Ltd., Toronto, Ont.

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Neville-Cooper Co., Toronto.

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Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
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Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

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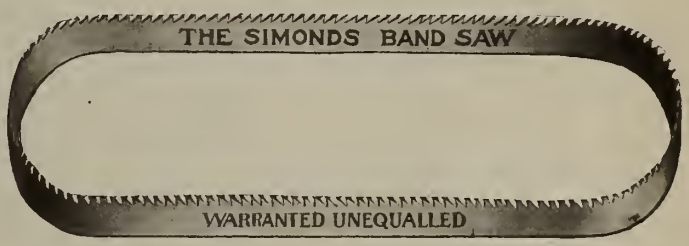
STARTED right with the finest nickel alloy steel and made mechanically right by expert saw makers Simonds Band Saws have long been recognized as leaders in woodworking shops. They hold their tension and retain their cutting edge longer.

SIMONDS
BAND SAWS



Simonds Canada Saw Co., Ltd.

"The Saw Makers"

St. John, N.B. **Montreal, Que.** **Vancouver, B.C.**

"Canadian Woodworker" Buyers' Directory—Continued

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Taylor Mfg. Co., Jas. L., Poughkeepsie, N.Y.

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Jackson, Cochrane, & Company, Kitchener.
Oliver Machinery Co., Grand Rapids, Mich.
Pringle, R. E. L., Toronto, Ont.

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Jackson, Cochrane & Company, Kitchener, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

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Jackson, Cochrane, & Company, Kitchener.

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Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.

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Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Merritt Eng & Sales Co., Lockport, N.Y.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

GRINDERS (Tool)
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Jackson, Cochrane, & Company, Kitchener, Ont.

GRINDING WHEELS
Carborundum Co., Niagara Falls, N.Y.

GROOVERS
Atkins & Co., E. C., Hamilton, Ont.

GROOVING HEADS
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Mattison Machine Works, Rockford, Ill.

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Brown & Co., George C., Memphis, Tenn.
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Colborn, C. B., Memphis, Tenn.
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Klotz Machine Co., Sandusky, Ohio.
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Nash, J. M., Milwaukee, Wis
Whitney & Son, Baxter D., Winchendon, Mass

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HARDWOOD DIMENSION STOCKS
Colborn, C. B., Memphis, Tenn.

HARDWOOD LUMBER
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American Hardwood Lumber Co., St. Louis, Mo.
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American Walnut Association, Washington, D.C.
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Anderson, Shreiner & Mawson, Toronto, Ont.
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Bruce Co., E. L., Little Rock, Ark.
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Bury & Company, Robert, Toronto, Ont
Chapman & Dewey Lumber Co., Marked Tree, Ark.
Colborn, C. B., Memphis, Tenn.
Canadian General Lumber Co., Toronto, Ont.
Chicago Mill and Lumber Co., Chicago, Ill.
Darnell-Love Lumber Co., Leland, Miss.
Frye Lumber & Veneer Co., J. W., Dayton, O.
General Hardwood Lumber Co., Chicago, Ill.
Gulf Lumber & Trading Co., New Orleans, La
Heeney, Percy E., Kitchener, Ont.
Hyde Lumber Co., South Bend, Ind.
Kosse, Shoe & Schleyer Co., Cincinnati, O.
Kraetzer-Cured Lumber Co., Greenwood, Miss.
Leach & Co., J. D., Chicago, Ill.
Liverpool Hardwood Co., New York.
London Lumber Co., London, Ont.
Long-Knight Mfg. Co., Indianapolis, Ind.
Luehrman Hardwood Lbr. Co., St. Louis, Mo.
May Hardwood Co., R. R. Louisville Ky.
McLennan Lumber Co., Montreal, Que.
Memphis Band Mill Co., Memphis, Tenn.
Mengel Co., Louisville, Ky.
Merceau-Hawkins Tie Co., Huntington, W.Va.
Mowbray & Robinson, Cincinnati, Ohio.
Murrelle Lumber Company, Memphis, Tenn.
Nichols & Cox Lumber Co., Grand Rapids, Mich.
Otis Mfg. Co., New Orleans, La.
Paepcke Leicht Lumber Co., Chicago, Ill.
Pedwell Hardwood Lumber Co., Toronto, Ont.
Pickrel Walnut Co., St. Louis, Mo
Sawyer Goodman Co., Marinette, Wis.
Spencer, C. A., Montreal, Que.
Stark & Co., Jas. E., Memphis, Tenn.
Stimson Hardwood Co., J. V., Memphis, Tenn.
Stimson & Co., J. V., Owensboro, Ky.
Tennessee Lumber & Coal Co., Cincinnati Ohio.
Vail Cooperage Co., Fort Wayne, Ind.
Whiting Co., Wm. S., Johnson City, Tenn.
Wisconsin Lumber Co., Chicago, Ill.
Wayne Lumber Co., New York
Wood Mosaic Co., Louisville, Ky.
Yellow Poplar Lumber Co., Coal Grove, Ohio.

HYDRAULIC VENEER PRESSES
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Company, Wm. R., Toronto, Ont.

KNOBS
Waddell Mfg. Co., Grand Rapids, Mich.
Rowe Mfg. Co., Newaygo, Mich.

JOINTERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

KNIVES (Planer and others)
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

LATHES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock-Walker Machinery Co., Toronto, Ont.
Jackson, Cochane & Company Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.

LEATHER (Artificial)
Fibro Mfg. Company, Beverly, N. J.
Mechanical Leathers, Ltd., Toronto.

LEATHER (Upholstery Grains)
Mechanical Leathers Limited, Toronto.

MACHINE KNIVES
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Peter Hay Knife Company, Galt, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont

MIRRORS
Chicago Mirror & Art Glass Co., Chicago, Ill.

MITRE SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Disston & Sons, Henry, Toronto, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.

MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich.
Walter & Sons, J. Kitchener, Ont.

MULTIPLE BOXING MACHINES
Fay & Egan Co., J. A. Cincinnati, Ohio.
Nash, J. M., Milwaukee, Wis.

NAILS
Laidlaw Bale-Tie Co., Hamilton, Ont.

NAILING MACHINES
Morgan Machine Co., Rochester, N.Y.
Yates Machine Co., P.B. Hamilton, Ont.

OIL STONE GRINDERS
Oliver Machinery Co., Grand Rapids, Mich.

PANELS
Algoma Panel Co., Algoma, Wis.
Calhoun Plywood Co., Sheboygan, Wis.
Hardwood Products Co., Nennah, Wis.
Hay & Co., Woodstock, Ont.

PATTERN SHOP MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PERIOD MOULDINGS
Waddell Mfg. Co., Grand Rapids, Mich.

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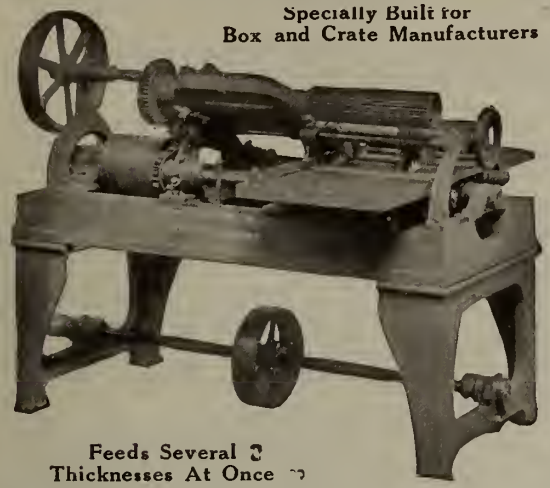
Specially Built for Box and Crate Manufacturers



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Has powerful feed and securely holds down and feeds short pieces. The feed rolls are automatically adjustable to varying thicknesses. Upper rolls are driven by cut gears, and the lower ones by sprocket chain. Several thicknesses of veneering can be fed thru machine at one time.

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Look over our partial list and if you do not see your requirements there—write-wire-or phone us:

1—Automatic Knob Machine.
1—Hand Screw Veneer Press, 38" 3 screw, American.
1—Gravity Swing Cut off Saw, McGregor Gourlay.
1—12" Moulder, Cowan & Co. 4 Sided.
1—7" Moulder, Goldie McCulloch, 4 Sided.
1—7" Moulder, Cowan & Co. 3 Sided.
1—16" Buzz Planer, Clark-Demill.
1—36" Preston Band Saw.
1—30" x 12" McGregor Gourlay Double Surfacer.
1—26" x 7" Crescent Single Surfacer.
1—Planer & Matcher S.A. Woods 15" x 6"
1—Double Exhauster 45" American Blower Co.
6—Belt Sanders.
1—6' Linderman Glue Jointer and Dovetailer.
1—14" Variable Speed Barnes Drill Press.

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"Canadian Woodworker" Buyers' Directory—Continued

PLANERS
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLANER BELTS
Mechanical Leathers Limited, Toronto.

PLANING MILL MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Mattison Machine Works, Rockford, Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

PLYWOOD
Calhoun Plywood Co., Sheboygan, Wis.
Wisconsin Lumber Co., Rhinelander, Wis.

PRESSES (Veneer)
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Jackson, Cochrane & Company, Kitchener, Ont.
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Co., Wm. R., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.

REED
Carter & Co., E. T., Toronto, Ont.

REED MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.

RESAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

RIM AND FELLOE MACHINERY
Fay & Egan Co., J. A. Cincinnati, Ohio.

RIP SAWING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mackenzie Machinery Co., D., Guelph, Ont.
Mattison Machine Works, Rockford, Ill.
Mereen Johnson Machine Co., Minneapolis, Minn.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

ROSETTES
Waddell Mfg. Co., Grand Rapids, Mich.

RUBBING MACHINES
DeVilbiss Mfg. Co., Toledo, Ohio.
Mattison Machine Works, Rockford, Ill.

SAFETY DEVICES
Cowan & Company, Galt, Ont.

SANDERS
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Klotz Machine Co., Sandusky, Ohio.
Mattison Machine Works, Rockford, Ill.
Nash, J. M., Milwaukee, Wis.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SASH, DOOR & BLIND MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mattison Machine Works, Rockford, Ill.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company Preston, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SAWS
Atkins & Co., E. C., Hamilton, Ont.
Radcliff Saw Mfg. Company, Toronto, Ont.
Shurly-Dietrich, Ltd., Galt, Ont.
Simonds Canada Saw Co., Montreal, Que.

SAW SHARPENERS
Oliver Machinery Co., Grand Rapids, Mich.
Yates Machine Co., P.B. Hamilton, Ont.

SAW SWAGES
Atkins & Co., E. C., Hamilton, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.

SAW TABLES
Canada Machinery Corporation, Galt, Ont. ..
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Mereen Johnson Machine Co., Minneapolis, Minn.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

SCRAPING MACHINES
Canada Machinery Corporation, Galt, Ont. ..
Garlock Machinery Ltd., Toronto, Ont.
Whitney & Sons, Baxter D., Winchendon, Mass.

SCREW DRIVING MACHINERY
McKnight & Son Co., L. G., Gardner, Mass.
Reynolds Machine Co., Massillon Ohio.

SCROLL SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont. ..
Cowan & Company, Galt, Ont.
Jackson, Cochrane, & Company, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Oliver Machinery Co., Grand Rapids, Mich.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamiltonfi Ont.

SECOND-HAND MACHINERY
Cowan & Company, Galt, Ont.
Garlock Machinery Ltd., Toronto, Ont.
Petrie, H. W., Toronto, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Woodworking Machinery Co. of Buffalo, Buffalo, N.Y.

SHAPERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A. Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Sons, Baxter D., Winchendon, Mass
Williams Machinery Co., A. R., Toronto, Ont
Yates Machine Co., P. B., Hamilton, Ont.

SHAVING COLLECTORS
Canadian Blower & Forge Co., Kitchener, Ont.

STAINS
Ault & Wiborg, Toronto, Ont.

SINGLE SPINDLE BOXING MACHINES
Canada Machinery Corporation, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.

STAVE SAWS
Atkins & Co., E. C., Hamilton, Ont.

STAVE SAWING MACHINE
Whitney & Son, Baxter D., Winchendon, Mass

STEEL DOOR MATS
Cary Mfg. Company, Brooklyn, N.Y.

SURFACERS
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Petrie, H. W., Toronto, Ont.
Preston Woodworking Machinery Company, Preston, Ont.
Whitney & Son, Baxter D., Winchendon, Mass.
Yates Machine Co., P. B., Hamilton, Ont.

SWING SAWS
Atkins & Co., E. C., Hamilton, Ont.
Canada Machinery Corporation, Galt, Ont.
Colladay Machine Works, Indianapolis, Ind.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Radcliff Saw Mfg. Co., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE LEG LATHES
Fay & Egan Co., J. A., Cincinnati, Ohoa.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Whitney & Son, Baxter D., Winchendon, Mass.
Yates Machine Co., P. B., Hamilton, Ont.

TABLE SLIDES
Walter & Company, B., Wabash, Ind.

TEMPERATURE REGULATORS
Canadian Powers Regulator Co., Toronto, Ont.

TENONING MACHINES
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Compan, Kitchener, Ont.
McKnight & Son Co., L. G., Gardner, Mass.
Merritt Eng & Sales Co., Lockport, N.Y.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Preston, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TIME CLOCKS
International Business Machines Co., Toronto, Ont.

TOPS
Calhoun Plywood Co., Sheboygan, Wis.

TRIMMERS
Arbuthnot Lumber Sash & Door Co., Vancouver, B.C.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Fay & Egan Co., J. A., Cincinnati, Ohio.
Garlock Machinery Ltd., Toronto, Ont.
Oliver Machinery Co., Grand Rapids, Mich.
Preston Woodworking Machinery Company, Pretson, Ont.
Williams Machinery Co., A. R., Toronto, Ont.
Yates Machine Co., P. B., Hamilton, Ont.

TRUCKS
National Dry Kiln Co., Indianapolis, Ind.
Oliver Machinery Co., Grand Rapids, Mich.
Shantz, P E., Preston, Ont.

TURNED WOOD GOODS
Canada Wood Specialty Co., Orillia, Ont.
Rowe Mfg. Co., Newaygo, Mich.
Walter & Sons, J. Kitchener, Ont.

TWINES & WEBBING
Doon Twines, Ltd., Kitchener, Ont.

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NAILING MACHINES

Are built strongly for heavy continuous service. Machines adapted to all kinds of special nailing.

Regular machines for all sizes of boxes and crates.

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Machines that save money

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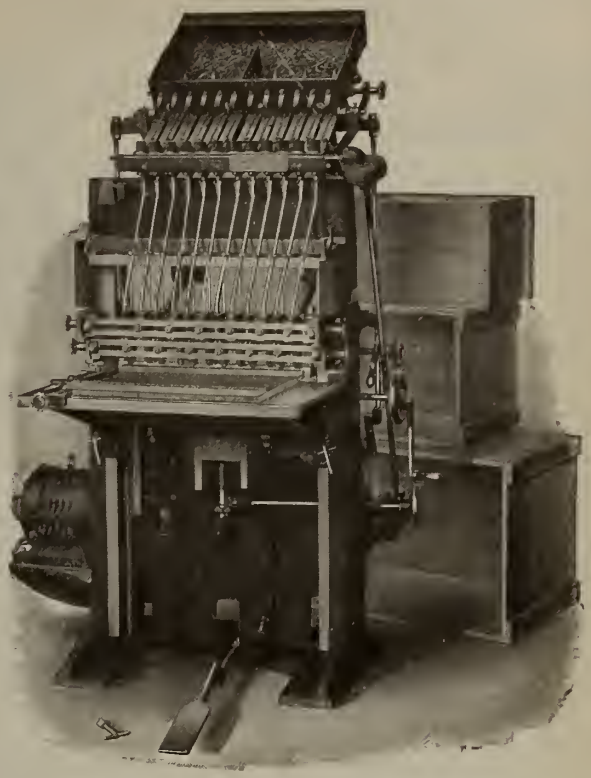

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Electric power, heating, lighting and equipment problems are to be found in the woodworking industry.

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Address .....

"Canadian Woodworker" Buyers' Directory—Continued

VARNISHES
Ault & Wiborg Company, Toronto. Ont.
Penfound Varnish Co., Toronto, Ont.

VARNISH DRYERS
Nicholls Co., A. S., New York, N.Y.

VARNISH SPRAYERS
DeVilbiss Mfg. Co., Toledo, Ohio.
Paasche Air Brush Company, Chicago, Ill.

VENEERS
Birds Eye Veneer Co., Escanaba, Mich.
Bury & Compny, Robert, Toronto, Ont.
Central Lumber Co., Indianapolis, Ind.
Freiberg Lumber Co., Cincinnati, Ohio
Frye Lumber & Veneer Co., J. W., Dayton, O.
Hartzell, Geo. W., Piqua, Ohio.
Hoffman Bros. Company, Fort Wayne, Ind.
Long-Knight Lumber Co., Indianapolis, Ind.
Litton Veneer Co., Rockford, Ill.
Memphis Veneer & Lumber Co., Memphis, Tenn.
Mowhawk Veneer Co., Warren, Pa.
Munising Woodenware Co., Munising, Mich.
Northwestern Cooperage & Lumber Co., Gladstone, Mich.
Ohio Veneer Company, Cincinnati, Ohio.
Penrod-Jurden Co., Memphis, Tenn.
Penrod Walnut & Veneer Co., Kansas City, Mo.
Pickrel Veneer Co., New Albany, Ind.
Southern Veneer Mfg. Co., Louisville, Ky.
Standard Veneer Co., Portland Me.
Stimson Veneer & Lumber Co., Memphis, Tenn.
Talge Mahogany Co., Indianapolis, Ind.
Toronto Veneer Company, Toronto, Ont.
Veneer Manufacturers Co., Chicago, Ill.
The Williamson Veneer Company, Mills—Baltimore, Md. Sales Branches, New York, N. Y., Chicago, Ill., Jamestown, N.Y., High Point, N.C
Wisconsin Lumber Co., Rhinelander, Wis.
Wood Mosaic Co., Louisville, Ky.

VENEER SAWS
Atkins & Co., E. C., Hamilton, Ont.

VENEER TAPE
Canadian Nashua Paper Co., Peterboro, Ont.
Gummed Products Co., Troy, Ohio.
Ideal Coated Paper Co., Brookfield, Mass.

VENTILATING APPARATUS
Canadian Blower & Forge Co., Kitchener, Ont.
Neville-Cooper Co., Toronto.

VENEER JOINTERS
Garlock Machinery Ltd., Toronto, Ont.

VENEER MACHINERY
Merritt Eng & Sales Co., Lockport, N.Y.
St. Joseph Iron Works, St. Joseph, Mich.

VENEER PRESSES (Hand and Power)
Black Bros. Co., Mendota, Ill.
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Farquhar Co., A. B., York, Penn.
Garlock Machinery Ltd., Toronto, Ont.
Jackson, Cochrane & Company, Kitchener, Ont.
Merritt Eng & Sales Co., Lockport, N.Y.
Perrin & Company, Wm. K., Toronto, Ont.

VENEER LATHES
Merritt Eng & Sales Co., Lockport, N.Y.

VISES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WALNUT LUMBER
American Walnut Mfrs. Assn., Chicago.
Frye Lumber & Veneer Co., J. W., Dayton, Ohio.
Pickrel Walnut Company, St. Louis.
Purcell Walnut Lumber Co., Frank, Kansas City.

WINDOW FRAME MACHINE
Atlas Mfg. Co., Orlando, Florida.

WIRE
Laidlaw Bale-Tie Co., Hamilton, Ont.

WIRE BOX STRAPPING
Cary Mfg. Company, Brooklyn, N.Y.

WOOD FINISHES
Ault & Wiborg, Toronto, Ont.
Penfound Varnish Co., Toronto, Ont.

WOODWORKING MACHINERY
General Machinery Co., Toronto, Ont.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOOD TURNING MACHINERY
Canada Machinery Corporation, Galt, Ont.
Cowan & Company, Galt, Ont.
Garlock-Walker Machinery Co., Toronto, Ont.
Mattison Machine Works, Rockford, Ill.
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.
Yates Machine Co., P.B. Hamilton, Ont.

WORK BENCHES
Fay & Egan Co., J. A., Cincinnati, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOOD LATHES
Ober Mfg. Co., Chagrin Falls, Ohio.
Oliver Machinery Co., Grand Rapids, Mich.

WOODWORKING SPECIALTIES
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Will pull its owner over many a hill. An out-of-date, wasteful, under-capacity Boiler should be changed now for a modern, efficient Boiler such as we make, because our prices are surprisingly low and our service good.

A Section of our Boiler Department.

Engineering and Machine Works of Canada, Limited
St. Catharines, Ont.

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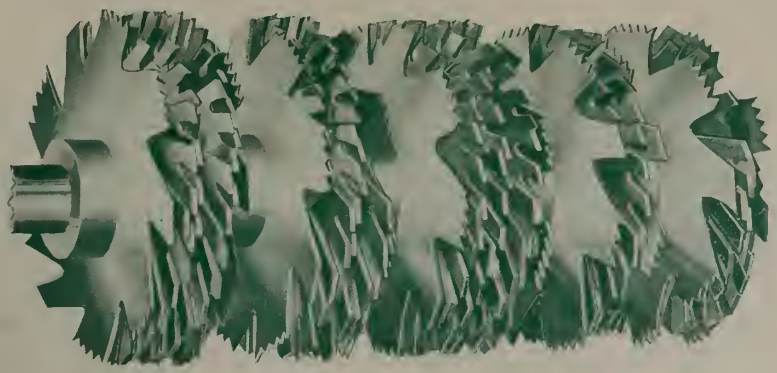
Hall Machinery Co., Sherbrooke Que., and Birk's Bldg., Montreal



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1 Rip Saw with dia 10" Bore 1" sharpened and set ready for use

I am uncertain about gauge, but I should say it ought to make a cut about 1/8" or rather allowing 1/8" for waste.

The **Dado Head** reached my highest expectations. It has the old style beat one hundred per cent.

Trusting you will favour me with prompt service,

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Respectfully yours,
(Sgd.) Walter Coek,
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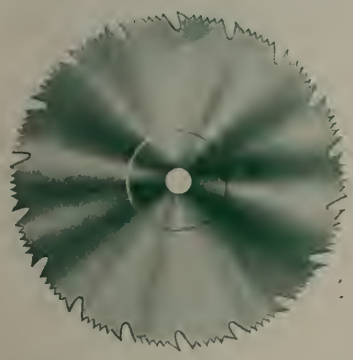


100% Production

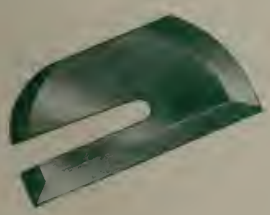
will be necessary to meet the demand for all wood-working material and furniture that will be required for the 4,000,000 buildings that must be erected in 1921.

ATKINS

STERLING QUALITY

SAWS and KNIVES

will make it possible for you to meet this demand in producing your share.



The high grade material and expert construction of Atkins Saws and Knives make possible the superior service they render.

Let Their Efficient Performance Tell You the Atkins Story of Perfection.

Write to-day for our Knife Booklet "CW" and Pattern Template Paper.

E. C. ATKINS & CO., ***Makers of Sterling Saws***

Factory—HAMILTON, Ont. **Vancouver Branch—109 Powell Street**

One Man Shapes and Finishes Queen Anne Legs

The manufacturer of Queen Anne styles can now produce the legs at exceptionally small labor cost. One man can look after the automatic leg-forming lathe in connection with the operation of the belt sander or other machine; or as many as four of the lathes can be handled by one man, because the cutting operation is purely automatic.

Pneumatic sanding drums supply just the right resiliency for cleaning up the extreme curves

FOR your beautifully designed cabriole patterns there is no other machine so well suited as the Mattison "214" Automatic Leg-Forming Lathe. It is specially designed to produce the irregular-shaped Queen Anne legs accurately and at a minimum labor cost. The cutting operation is purely automatic which reduces the labor to the actual time required to change stock. The man who tends the lathe can sand a leg on the "115" Belt Sander while another is being cut in the machine.

The Combination Makes an Efficient Method

Sanding flat curves against cushioned sanding roll

The flexible open belt nicely finishes the rounds

BY free-hand manipulation of the leg diagonally against the open sandbelt, shaped forms or cushioned sanding rolls, the rough sanding is accomplished very quickly. The two sizes of pneumatic sand-covered drums provide a most practical and accurate method for perfectly finish-sanding the legs. This combination of both rough and finish sanding operations in the one machine together with the lathe for automatically shaping the legs, gives the manufacturer of Queen Anne furniture a method that minimizes costs and insures accurate production of his individual and distinctive patterns.

MATTISON
MACHINE WORKS
Rockford, Illinois, U. S. A.